

WEST Search History

DATE: Wednesday, February 05, 2003

<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
side by side		result set	
<i>DB=USPT; PLUR=YES; OP=OR</i>			
L13	L12 and l3 and l6	62	L13
L12	(display\$ or output\$ or screen\$) near9 (promotion or advertis\$ or coupon\$)	6861	L12
L11	L10 and l9	53	L11
L10	printer or print\$ near5 (unit or device or means)	150245	L10
L9	L8 and l7	109	L9
L8	(display\$ or output\$ or present\$ or screen\$) near9 (promotion\$ or advertis\$ or commercial)	20271	L8
L7	L6 and l5	2860	L7
L6	@ad<19990609	2841671	L6
L5	L4 and l3	3658	L5
L4	display\$ near7 (unit or device or means) or monitor	364734	L4
L3	l1 and l2	7226	L3
L2	(vehicle or automobile or automotive) near7 (position or location or locate\$)	86830	L2
L1	GPS or (position or location) near7 (receiver or detector)	79541	L1

END OF SEARCH HISTORY

WEST Search History

DATE: Wednesday, February 05, 2003

Set Name Query

side by side

DB=USPT; PLUR=YES; OP=OR

<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
L15	L14 and l4	43	L15
L14	L13 and l3	76	L14
L13	L1 same l2	9211	L13
L12	L11 and l8	30	L12
L11	L10 and l9	521	L11
L10	(purchas\$ or buy\$ or transaction) near5 (history or summary)	1334	L10
L9	identi\$ near5 (person or buyer or customer or consumer)	13589	L9
L8	L7 and l6	131	L8
L7	printer or print\$ near5 (unit or device or means or control\$)	159485	L7
L6	L5 and l4	386	L6
L5	l1 and l1 and l3	508	L5
L4	@ad<19990609	2841671	L4
L3	(display\$ or output\$ or provid\$) near9 (coupon or gift or certificate or promotion\$ or advertis\$)	8943	L3
L2	(position or location or orientation) near7 (receiver or detect\$)	166857	L2
L1	GPS or (global or vehicle or car or automobile) near5 (position or location or locate\$ or orientation)	101036	L1

END OF SEARCH HISTORY

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: ' ?show file;ds
: File 15:ABI/Inform(R) 1971-2003/Feb 05
:           (c) 2003 ProQuest Info&Learning
: ' File 9:Business & Industry(R) Jul/1994-2003/Feb 04
:           (c) 2003 Resp. DB Svcs.
File 610:Business Wire 1999-2003/Feb 05
:           (c) 2003 Business Wire.
File 810:Business Wire 1986-1999/Feb 28
:           (c) 1999 Business Wire
File 275:Gale Group Computer DB(TM) 1983-2003/Feb 04
:           (c) 2003 The Gale Group
File 476:Financial Times Fulltext 1982-2003/Feb 05
:           (c) 2003 Financial Times Ltd
File 636:Gale Group Newsletter DB(TM) 1987-2003/Feb 04
:           (c) 2003 The Gale Group
File 613:PR Newswire 1999-2003/Feb 05
:           (c) 2003 PR Newswire Association Inc
File 813:PR Newswire 1987-1999/Apr 30
:           (c) 1999 PR Newswire Association Inc
File 16:Gale Group PROMT(R) 1990-2003/Feb 04
:           (c) 2003 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
:           (c) 1999 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2003/Feb 05
:           (c) 2003 The Gale Group
File 20:Dialog Global Reporter 1997-2003/Feb 05
:           (c) 2003 The Dialog Corp.
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Set	Items	Description
S1	115299	GPS? OR (POSITION OR LOCATION) (7N) (RECEIVER? OR DETECTOR?)
S2	53432	(VEHICLE? OR AUTOMOBILE? OR AUTOMOTIVE?) (7N) (LOCATION OR LOCATE? OR POSITION)
S3	208040	(DISPLAY? OR OUTPUT?) (7N) (UNIT? OR DEVICE? OR MEANS)
S4	11534947	PD<990609
S5	91492	(DISPLAY? OR OUTPUT? OR SCREEN?) (10N) (PROMOTION? OR ADVERTISING? OR COUPON?)
S6	637	S1 AND S2 AND S3
S7	8	S6 AND S5
S8	0	S7 AND S4
S9	18	S1 AND S2 AND S5
S10	0	S9 AND S4
S11	5541	S1(S)S2
S12	13	S11 AND S5
S13	0	S12 AND S4
?		

File 80:TGG Aerospace/Def.Mkts(R) 1986-2003/Feb 04
(c) 2003 The Gale Group
File 637:Journal of Commerce 1986-2003/Feb 04
(c) 2003 Commonwealth Bus. Media
File 6:NTIS 1964-2003/Feb W1
(c) 2003 NTIS, Intl Cpyrght All Rights Res
File 63:Transport Res(TRIS) 1970-2003/Jan
(c) fmt only 2003 Dialog Corp.
File 635:Business Dateline(R) 1985-2003/Feb 05
(c) 2003 ProQuest Info&Learning
File 570:Gale Group MARS(R) 1984-2003/Feb 04
(c) 2003 The Gale Group

Set	Items	Description
S1	115299	GPS? OR (POSITION OR LOCATION) (7N) (RECEIVER? OR DETECTOR?)
S2	53432	(VEHICLE? OR AUTOMOBILE? OR AUTOMOTIVE?) (7N) (LOCATION OR LOCATE? OR POSITION)
S3	208040	(DISPLAY? OR OUTPUT?) (7N) (UNIT? OR DEVICE? OR MEANS)
S4	11534947	*deleted* PD<990609
S5	91492	(DISPLAY? OR OUTPUT? OR SCREEN?) (10N) (PROMOTION? OR ADVERTISE? OR COUPON?)
S6	637	S1 AND S2 AND S3
S7	8	S6 AND S5
S8	0	S7 AND S4
S9	18	S1 AND S2 AND S5
S10	0	S9 AND S4
S11	5541	S1(S)S2
S12	13	S11 AND S5
S13	0	S12 AND S4
S14	14771	GPS? OR (POSITION OR LOCATION) (7N) (RECEIVER? OR DETECTOR?)
S15	8852	(VEHICLE? OR AUTOMOBILE? OR AUTOMOTIVE?) (7N) (LOCATION OR LOCATE? OR POSITION)
S16	24715	(DISPLAY? OR OUTPUT?) (7N) (UNIT? OR DEVICE? OR MEANS)
S17	1134337	AD<990609
S18	857267	PD<990609
S19	15073	(DISPLAY? OR OUTPUT? OR SCREEN?) (10N) (PROMOTION? OR ADVERTISE? OR COUPON?)
S20	27	S14 AND S15 AND S16
S21	2940	S19 AND S18
S22	4	S20 AND S17
S23	21	S14 AND S15 AND S18
S24	4	S22 AND S17
S25	617	S14(S)S15
S26	0	S24 AND S18
S27	21	S25 AND S17
S28	2	S14 AND S15 AND S19
	?	

(FILE 'HOME' ENTERED AT 11:56:51 ON 15 JUN 2001)

FILE 'USPATFULL' ENTERED AT 11:56:58 ON 15 JUN 2001

L1 333315 S VEHICLE#
L2 101592 S PRINTER#
L3 5797 S GPS#
L4 1766995 S LOCATION# OR POSITION#
L5 321 S L1 AND L2 AND L3 AND L4
L6 2934 S (ADVERTIS? OR PROMOTION?) (4A) INFORMATION
L7 13 S L5 AND L6
L8 1299 S L1(P) L2
L9 31 S L1(P) L2(P) L3
L10 1 S L9 AND L6
L11 31 S L9
L12 30 S L11 AND L4

(FILE 'USPATFULL' ENTERED AT 10:36:26 ON 14 DEC 2001)
DEL HIS

FILE 'USPATFULL' ENTERED AT 10:58:11 ON 14 DEC 2001
L1 7369 S GPS?
L2 207537 S PRINTER? OR PRINTING
L3 850 S L1 AND L2
L4 12964 S AUTOMATIC? (5A) DISPLAY?
L5 142 S L3 AND L4
L6 7909 S COUPON# OR PROMOTION? (3A) INFORMATION
L7 948 S L6 (P) L2
L8 13 S L7 AND L1
L9 2 S L8 AND L4
L10 410517 S DISPLAY?
L11 1070 S L10 (P) L6
L12 948 S L2 (P) L6
L13 353 S L11 AND L12

WEST

 [Generate Collection](#) [Print](#)

L11: Entry 13 of 53

File: USPT

Oct 17, 2000

DOCUMENT-IDENTIFIER: US 6133853 A

TITLE: Personal communication and positioning system

DATE FILED (1):19980730Abstract Text (1):

A location tagged data provision and display system. A personal communication device (PCD) with electromagnetic communication capability has a GPS receiver and a display. The PCD requests maps and location tagged data from data providers and other for display on the PCD. The data providers respond to requests by using searching and sorting schemes to interrogate data bases and then automatically transmitting data responsive to the requests to the requesting PCD.

Brief Summary Text (4):

Availability of up-to-date information is more important today than ever before and this will continue to be true for the foreseeable future. People want to be well informed, so much so that they travel with cellular phones, beepers, and even portable hand-held Global Positioning System (GPS) satellite receivers.

Brief Summary Text (5):

GPS capable devices generally have a GPS receiver for receiving satellite signals from the GPS satellite network that allow for determination of the device's position. Such devices allow for precisely locating the device in terms of latitude and longitude using the GPS receiver. Some devices have map data stored in memory and a display for showing the device position with reference to the map data. Other devices have no underlying map data base for reference. Rather, they show only the geographic coordinates of the device's location. These coordinates may be referred to as waypoints. Most GPS receiver devices can store many waypoints. Some GPS receiver devices can plot and display a trail of waypoints and store this trail for future retrieval. Sophisticated devices may compute the device's heading, speed, and other information based on comparisons with previous GPS determined positions.

Brief Summary Text (6):

GPS receiver devices with map display capability may store the map information on computer diskettes, CD-ROM's, or other computer memory storage devices. The device location may then be displayed on a display terminal with reference to a map stored in the computer memory storage device. The available quantity of map data, however, can overwhelm the memory capability of easily portable computer devices. This problem is exacerbated when additional information is included and linked with the map data. In addition, information is more valuable when it is up to date and available at the time of consumption, and such devices do not incorporate a means for updating the stored information. By way of example, a CD ROM could never maintain an up-to-date list of every 5-star restaurant.

Brief Summary Text (7):

Some GPS receiver devices have the ability to communicate over a telecommunications network. These devices do not provide for automatic or semi-automatic dynamic exchange of on-line position dependent or related information. In addition, these devices cannot communicate with third parties in the absence of a uniform data format standard. For example, a cellular-phone-based system comprising GPS location information working in conjunction with proprietary Public Safety Answering Point (PSAP) telephone equipment is known. The device provides personal and medical

- information on an emergency basis to the proper authorities. Such a device does not allow third parties to communicate, tag, interrogate, limit, designate, modify or share this information amongst themselves for any other use.

Brief Summary Text (8):

To that end, the ability to receive digital data structures with GPS encoding, and storing this information for eventual use or broadcast to third parties, would be valuable. Today, the U.S. and several other countries have independent publishers busily GPS mapping everything down to the most minute detail. Most of these data bases are available on CD ROM storage. The problem is that no one data base can contain enough information to fulfill the unique requests of every particular and picky consumer. The costs associated with providing and maintaining such a large data base would be overwhelming and over-burdening. Additionally, most consumers do not like reading or compiling vast data bases.

Brief Summary Text (10):

The system of the present invention utilizes Personal Communications Devices (PCDs), and traditional computer systems with GPS engines, routers, and other application programs to request, process, and transmit tagged GPS encoded information. The system, with related applications, can be accessed by device users, traditional computer users, web-site users (cyberspace), data publishers, public or private enterprises or individuals, by means of application programs. The tagged GPS encoded data files can be stored or sent via communication links using AM, FM, spread spectrum, microwave, laser or light beam in free or fiber optic, line-of-sight, reflected, satellite, secure or non-secure, or any type of communications between multiple points that the application or the state-of-the-art may allow. The system is a waypoint tag and interrogation system using various protocols to answer requests and provide GPS-encoded information. The applications use GPS devices, engines, routing and encoding for access to specific requester-designated data retrieval requests. The applications access fax machines, beepers, telephones and other communication linked devices. The system accesses computer and storage systems with various applications in order to provide this information from a plurality of providers. The system thereby eliminates or reduces the need for large storage devices and interchangeable storage modules.

Brief Summary Text (11):

One embodiment of the present invention includes a requesting device, a data provider (hardware and software), a user, tagger applications or GPS engine and router system with protocols for encoding, tagging, modifying, interrogating, arranging, limiting, displaying, sorting, mapping, segregating, sending, receiving and updating waypoint and the waypoints connected data structures with digital or graphic maps, digital voice files, linked digital web files properly encoded and tagged by way of specific devices, or by traditional computer and storage systems.

Brief Summary Text (12):

The application programs contain protocols for users, providers, taggers, list maintenance organizations, and others, and will use a dynamic identification system from applications containing GPS search engines,

Brief Summary Text (14):

The PCD is a cellular-phone-sized electronic device, combining the capabilities of a GPS receiver, transceiver, digital beeper, cell phone and projection system into one compact unit. The PCD is capable of uploading emergency information (medical, police alert, etc.) via a one-push button that phones 911 or a security monitoring center similar to those used for house alarms. The alert continues to be broadcast until a response is made.

Brief Summary Text (15):

The PCD is also capable of downloading information via a request to a data provider, similar to a request for directory information from a phone company or other service. In this mode the PCD acts similar to calling a phone operator for information. However, in this instance, no human contact is required. The caller requests specific information (location of gas stations, names of restaurants, local banks, etc.) via a voice command ("Download e.g., Wells Fargo Banks") or via digital commands using a keypad or other input device and the requested information is automatically downloaded

- to and stored in the memory of the user's PCD. This information can be accessed off-line via the screen on the PCD. It is all done digitally, eliminating having to write down information such as name, address, location map, GPS latitude and longitude encoding, direction and distance to location, hours of operation, or other items of information. The PCD can be plugged into an automobile input port or similar device, if available, and provide distances and directions to locations of interest. Similar information of a condensed nature can also be provided to the user via the screen of the PCD. The user is not required to be a subscriber to some proprietary system, instead the PCD can use any means to access any data base from any potential provider, whether GPS encoded or not.

Brief Summary Text (16):

In some areas the information would be sent and received by way of a Local Area Broadcast via radio frequency signals to each home, car or PCD within a reception area. In such an embodiment, users are able to access companies listed on the broadcast network from data providers of properly tagged, yellow page-type information or are provided with GPS encoded information and maps similar to web page listings. This would be advantageous to small towns with little information available for travelers, but which have an interest in providing up-to-date traffic, weather and travel advisories to benefit the local community and businesses. Such a system does not require a master, home or base unit. The providers of data base or advertising information could be a single data provider and could also be individual users with application programs that allow provision of such data. The application programs provide a means for sending and receiving data, GPS encoded data and graphics encoded data. The application programs can also act as a universal coder/decoder to other proprietary GPS data bases.

Brief Summary Text (21):

4. GPS tagging and encoding with latitude and longitude information along with encoded maps for navigation.

Brief Summary Text (23):

6. On-line storage of data personal and other information, along with GPS encoded maps on some data files.

Brief Summary Text (24):

7. Display menus, interfaces and applications can be viewed on heads-up display systems in automobiles, homes, businesses and various commercial applications.

Brief Summary Text (27):

Remote and distant third parties could communicate with each other and, by sending and receiving GPS encoded data, can meet or find each other in remote locations. Maps and other digital data may be transmitted/received by fax, beeper (receive only), computer, phone and radio.

Brief Summary Text (28):

The system also utilizes a system of non-subscribers communicating to each other in a similar fashion, without the use of base stations. In addition, the non-subscribers could send personal data bases with maps included, GPS information, and other information of non-related data or graphics from publishers of any such data base. In this embodiment the device would act as a transceiver, sending and receiving dynamic moving waypoint information in digital formats, including maps of various sizes and embodiments.

Brief Summary Text (29):

The PCD can display a singular or a plurality of images and displays, project an image on to a screen or viewing surface, store or communicate data (depicted as a line, graphic, icon, etc.) to and/or receive latitude and longitude data from third parties. Additionally, the device can send/receive latitude- and longitude-encoded maps and other data to/from a third party, send/receive standard or non-standard phone and fax communications (AM, FM, spread spectrum, microwave, laser or light beam in free or fiber optic, line of sight, reflected, satellite, secure or non-secure, or any type of communications between two points that the application or state-of-the-art may allow), perform computer functions from existing application software and operating systems, receive standard or non-standard beeper messages, interface with a conventional

- computer and provide an interface to a heads-up display, an external viewing device or any projection system.

Brief Summary Text (30):

An embodiment of this invention incorporates a GPS transceiver with a designated application used with a communication system or network. Several users can communicate and send data, maps and graphic files with or without GPS encoding. By example, a user could request from sensing, weather, or condition reporting devices details concerning remote locations. These sensing, weather, and condition reporting devices may also be accessible over cable land lines or other communication media.

Brief Summary Text (31):

In one embodiment of the device and tagging system information is communicated from locations, homes, businesses, commercial designations, government resources, public and private areas, cyberspace and other communication systems. Various designated locations, or a plurality and multiplicity of locations, or data structures, are assigned as waypoints. These waypoints could be tagged, or interrogated from an application program which describes, encodes, reports, modifies and communicates this encoded information and data from any location. In addition, the transmitting device may report a plurality and multiplicity of locations or events unrelated to either the location of either the transmitting or receiving device. Indeed, the device could communicate to many unlinked, unreported or unconnected waypoints and send active dynamic information to the requester. Cyberspace providers may enter the network web system, use applications for device communications and participate in the exchange of information using designated GPS engines and applications. By way of example, the invention can provide a requester with dynamic location information, or other data to a location anywhere in the U.S. This location information may be used to locate individuals in determining whether to authorize credit requests, whether PCD or item containing a PCD, such as an automobile, is moved, or in routing electronic communications.

Brief Summary Text (32):

The system is similar to the world wide web, except the web does not use GPS engines, applications, tagging systems, etc. By way of example, one difference is that the invention uses GPS devices, engines, applications and encoding for access to specific requester designated data retrieval techniques. Indeed, the invention provides a means to locate specific individuals both physically and in terms of an electronically accessible location.

Brief Summary Text (33):

Another advantage the invention provides is a means to display this type of information and a means to store data unrelated to any interrogation by the PCD device. Methods of display include multiple of displays including, by example, overhead displays, heads-up displays, projection systems, LCD displays, computer displays or any past or future designed displays whether connected directly or by some electromagnetic means. The preferred embodiment of the device could include any means of display or combinations thereof. In addition, the device could include many control devices such as remote control, remote mouse type devices and any combination of keyboards.

Drawing Description Text (3):

FIG. 1 illustrates a GPS transceiver system and communication links incorporating the present invention;

Drawing Description Text (10):

FIG. 5C illustrates a flow chart depicting the program sequence for the user to control the GPS mode of the PCD of FIG. 2;

Drawing Description Text (15):

FIG. 7 illustrates the select GPS Function page of the PCD of FIG. 2;

Drawing Description Text (29):

FIG. 21 illustrates a typical GPS encoded map downloaded from a data provider;

Drawing Description Text (30):

FIG. 22 illustrates a typical GPS encoded map with waypoints locating restaurants within a specified radius;

Drawing Description Text (37) :

FIG. 28 illustrates a software module configuration of the GPS engine;

Drawing Description Text (47) :

FIG. 38 illustrates a PCD displaying a trail plot with condition reporting device locations;

Drawing Description Text (49) :

FIG. 40 illustrates a PCD display showing information received from a condition reporting device;

Detailed Description Text (2) :

FIG. 1 shows a system capable of communicating using the electromagnetic energy spectrum, traditional computer networks, cellular phone networks, public telephone networks, and satellite system networks. The major components of the system comprises personal communication devices (PCDs) 20 and one or more of the following: a cellular phone network 60, a standard phone line network 70, an electromagnetic energy spectrum network 80 and/or a computer network 90. The PCD receives signals from a GPS satellite system 10.

Detailed Description Text (3) :

FIG. 2 illustrates a PCD of the present invention. The PCD has a display 28a. The display may be of a LCD type or other types known in the art. Incorporated with the display is a touch screen input device 28b, which are known in the art. The PCD also has a alphanumeric key pad 26, which includes many of the standard keys generally found on computer keyboards. The location of the keys, and the selection of the characters used on a single key, may be varied as desired. The PCD also has specialized keys 27a-g, n related to GPS, telecommunications, and other functions. Located on one side of the PCD are a number of input and output ports. In the embodiment shown, these ports include a modem output port 29g, a generalized communication port 29f, a power port 35b, an infrared port 29e, and a heads-up display interface port 25k. The location of these ports are shown for descriptive purposes only, the specific location of these ports on the PCD is not critical. The power port allows the PCD to be operated from an external power source (not shown). The communication port allows the PCD to be connected to printers, local computer networks, and the like.

Detailed Description Text (5) :

extends from the edge near the speaker to allow for communication in a cellular telephone network or via other electromagnetic spectrum means. The PCD contains a battery 38a. The battery allows for mobile operation of the PCD and is the selected power source if an external power source is not available through the power port. The PCD's operation is governed by a processor 21. A variety of microprocessors may be used, with the selection of such determined by processing power, power utilization, and other factors and requirements. The PCD has a slot 23 for a PCMCIA card, CD-ROM, or other computer accessory. The PCD is powered on when the power button 31 (shown in FIG. 2) is depressed. In the embodiment shown, at initial device power on, the processor causes the PCD to display the initialization screen 100 (shown in FIG. 2) .

Detailed Description Text (6) :

FIG. 4 shows a block diagram of the PCD. Control and logic functions are performed by the processor 21. Internal data storage 22, which is provided by conventional memory such as RAM or ROM or variations thereof, may be accessed by the processor. The processor may also access removable data storage devices 23 such as a hard disk installed via the PCMCIA slot, a CD-ROM type device or other similar removable data storage devices. The processor is connected by a data bus 24 to a number of devices. These include the alphanumeric key pad and other special purpose keys, the touch screen, and other hard wired input devices. The heads-up display output port and the display screen are also connected via the data bus to the processor, it being recognized that a number of display related devices such as VGA cards, chips, and the like are also required to implement the display device functions and the other previously mentioned functions. The microprocessor may also access or control

communications with telephone networks, either hardwired or cellular, radio transmissions, infra-red transmissions, or communications with other computer devices.

Detailed Description Text (7):

All known verbal commands from GPS systems can be implemented and attachment or inclusion of voice activation for map instructions relative to location, GPS and street designations, including heading descriptions, distance, and arrival time estimates can be included.

Detailed Description Text (8):

FIG. 24 illustrates a block diagram of the PCD's software components. An application module or program 51 interfaces with the PCD's operating system 241. The operating system may be DOS, UNIX, Windows 95, Windows NT, O/S2 Apple Mcintosh, Next Computer, or other operating systems, including operating systems well suited to devices with constrained memory or other limitations due to the small physical size of the PCD. The operating system additionally interfaces with other application programs 242 that provide standard file edit and other functions typically found in personal computers. The operating system, or other application programs interfacing with the operating system, provide for maintenance of data bases 245 used by the PCD. The application module includes a GPS engine 53 providing GPS functions, including interfacing with the GPS receiver 243 (shown in FIG. 4). A query menu program 54 of the application module controls the graphical user interface and related functions for the device. Included in the application module is a universal converter 55.

Detailed Description Text (11):

FIG. 4A shows the top level page menu display hierarchy of the PCD. At initial power on the initialization page 25a (shown in FIG. 2) is displayed. The initialization page allows for the entry of a personal identification number and other data. Depressing the home button 27E (shown in FIG. 2) displays the Main Menu page 25b. A number of additional pages are available from the Main Menu page. These include the GPS 25c, Fax 25d, Beeper 25e, Phone 25f, Computer 25g, Radio 25h, Send Queue 25i, and Receive Queue 25j pages.

Detailed Description Text (14):

In addition, the Initialization page 100 FIG. 2, as well as all other pages, displays the time and the date 103, touch points for QUE IN 550 and OUT 600 (described later in this document) and limited GPS information 107. The limited GPS information comprises of the user's location (latitude and longitude), an arrow pointing to north and an arrow indicating direction of device travel.

Detailed Description Text (15):

When enabled, pressing the HOME button 27e (FIG. 2) signals the processor to display the Main Menu page 150 FIG. 5B. As shown in FIG. 6, the Main Menu page allows the operator to use the touch screen to select the GPS 200, FAX 300, BEEPER 350, PHONE 400, COMPUTER 450, RADIO 500, RECEIVE QUE 550 and SEND QUE 600 touchpoints. The heading and directional information are displayed in real time and are dynamic. Pressing the FAX touchpoint causes the processor to display a Fax page (shown in FIG. 12) which lists received facsimile messages 301. The Fax page includes display interfaces appropriate for the sending and receiving of facsimile communications through the FAX Phone Modem port 29g, and such displays and functions are well known in the art. Pressing the BEEPER touchpoint causes the processor to display a Beeper page (shown in FIG. 13). The Beeper page displays received beeper messages 351 and allows for the deletion of such messages from the display and internal memory storage. Also, a sub-menu portion of the display 151 is reserved for sub-menus and directories.

Detailed Description Text (16):

Pressing GPS 200 causes the processor 21 to display a GPS Function page 201, which is illustrated in FIG. 7. The GPS page provides for selection of a GPS mode through touch points in the sub-menu portion of the display. The available modes are location 210, show me 230, get map 250 and third party 270 modes. The display returns to the GPS Function page when the PREVIOUS button 27i (shown in FIG. 2) is pressed. The display hierarchy for the GPS functions is illustrated in FIG. 5C. The Location, Show Me, Get Map, and Third Party pages descend from the GPS Menu page. The Location page comprises

- the current map, the location on the map of the device, and a plot of the trail of the device on the map. The sub-menu portion of the display provides for additional selection of still further pages. These pages include a Menu page, a Mode page, a Waypoint page, and a Preferences page.

Detailed Description Text (17) :

The Location page is illustrated in FIG. 8. The Location page includes a GPS map 219 (latitude and longitude encoded coordinate pairs). The sample page shown is an encoded map showing the device position, plot trail and the encoded map location of the selected waypoint. The map displayed could be from on-board memory or sent by other third parties by way of communication links to the PCD. When map data files are encoded with location information, the location information can be referred to as waypoints. These tagged waypoints, with links to other data structures, can then be sent to users via an application to various communication systems. Closed-loop or proprietary GPS receivers can send/receive data to/from other third parties (Brand X, Brand Y) via their own proprietary format using an application system as a universal converter. The location information is dynamic and updated periodically by the PCD's communication system via link-up with GPS-based satellites. The Location page indicates the PCD position 801, indicated by a walking person, as being located on a highway 810. A waypoint 802 is along the highway en route to the desired destination address 803 located on a local street 804 which intersects the highway. A first point of interest 807 is also displayed as being along the highway, as is a second point of interest 805 along a second local road intersecting the highway. The limited GPS information, providing location, heading and north, is also displayed. The illustrated Location page display shows only one possible combination of a map layout. Other display sequences such as North up, course up, user at top of screen, user in middle, and other display sequences are possible. The dynamic nature of the PCD allows the PCD to display GPS encoded maps as the PCD progresses dynamically with relation to the maps.

Detailed Description Text (18) :

Using interpolation techniques, performing spatial query analysis, and establishing layers for best display scale for any given map record allows the device to provide the user extended capability not possessed by traditional GPS devices. Applying various protocols and interpolation techniques allow files to be arranged geographically by distance from a designated point (usually the requesters latitude and longitude as the starting point, but other locations may also be used). The maps are also arranged in layers, menus, limited, listed, showed, displayed, and sorted.

Detailed Description Text (19) :

The Location mode provides typical GPS system functions. The touch points MENU 213, MODE 215 and WAYPOINT 217 and PREFERENCES 221 provide access to the Menu, Mode, Waypoint, and Preferences pages. These pages, along with various buttons on the alphanumeric key pad 26 FIGS. 2 and 4 and special function buttons 27, are used to configure the display to the user's preference. The preferences page 221 enables selection of such features as voice, maps, scroll, off screen maps away from cursor and other features. The listing name 219 portion of the Location page displays information pertaining to a waypoint selected through the use of the cursor.

Detailed Description Text (20) :

FIG. 9 illustrates the Show Me page accessed from the GPS page. The Show Me page shows a list of available maps 901a-i stored on-board, which includes maps retrieved from the receive queue area of the PCD memory. The user can load a map into the location or third party pages by pressing the corresponding number key on alphanumeric key pad 26 (shown in FIG. 2) or by scrolling through the list to highlight the appropriate map and then pressing ENTER button 27g. Maps may also be removed from on-board storage using the DELETE button 27h.

Detailed Description Text (21) :

FIG. 10 illustrates the Get Map page accessed from the GPS Menu page. The user of the PCD can request the map by location from PCD memory or an external source. The user may enter a desired map location. If a map location is entered, the PCD will only search PCD memory for a map for the entered location. Maps from an external source are downloaded via any of the communication links such as the FAX, BEEPER, PHONE or RADIO touchpoints provided in the sub-menu portion of the display 151. Depending on the

- user's requirements, several maps could exist showing similar map areas with different layers for viewing. By way of example, airport maps with air space requirements, coastal waterway, maps, and interstate maps, and even hand drawn maps scanned into a computer system all show different resources within a given geographic area. These maps, when presented on the PCD, could over-saturate the display map detail for any given map area. Therefore, it is preferred that the actual map displayed be selectable. Maps are retrieved by pressing QUE IN 550, scrolling to highlight the desired map, and pressing ENTER 27g FIG. 2.

Detailed Description Text (22):

FIG. 11 illustrates the Third Party page accessed from the GPS menu page. The Third Party page provides an interface to communications with a third party through touch points in the sub-menu display 151. In the display shown, a user can receive a third party's data and GPS encoded map for viewing on the device or save it for future usage. The user can also dynamically track the third party by periodically having the third party send updates via normal communication links. The third party location can be displayed on maps dynamically sent by map publishers, maps already on-board (furnished at some earlier date), or on maps sent by the third party. The PCD plots and interpolates the GPS data sent by the third party and places an icon 951 (GPS latitude and longitude coordinate pair) on the displayed map using spatial query analysis techniques performed by an application module. The information received from the third party may be other than maps or GPS encoded information, but may be information of any type. The data is received from the third party using phone 400 and radio communication links 500. A PREFERENCES touch point 274 enables entry of items such as phone numbers for automatic call back and time interval for automatic transmission of information. If the radio, a satellite phone, or other frequency based communications link is utilized, the PREFERENCES touch point allows entry of frequencies for use for automatic transmission of information. A split screen displays the user's location on a map on the left side of display 272 and, after contact with a third party via a communication link, the third party's map and location on the right side of display 273. If the third party's location is sufficiently close to the user's location, or if the user's displayed map covers a sufficiently large area, both the user's and third party's location can be shown on the same map without resort to a split screen display.

Detailed Description Text (23):

The Fax page is accessed by pressing the FAX touchpoint on the Main Menu page. FIG. 12 illustrates the Fax page. The sub-menu portion of the display is available for listing previously stored phone numbers. These phone numbers are selectable as a facsimile destination. In addition, the user can directly enter the phone number to indicate the facsimile destination. As with other pages, the PCD continues to dynamically display the limited GPS information of location, north and heading. The PCD facsimile function is performed by application software executed by the processor. Multiple fax locations, time set, send after certain time, and other traditional functions of fax machines and their implementation are well known in the art. The Fax page provides for display of a message (not shown) entered via the alphanumeric key pad 26 (shown in FIG. 2) or

Detailed Description Text (26):

The Phone page is illustrated in FIG. 14. The Phone page is accessed from the Main Menu page. Pressing the PHONE touchpoint on the Main Menu page causes the processor to display the Phone page. The Phone page is also accessed by pressing the PHONE touchpoint on the Get Map and Third Party pages. As with the other pages, the limited GPS data is continuously displayed showing PCD location, heading, and north. The PCD can access several areas of the display even while the PCD is being used as a telephone. Information provided in the display area 1401 will vary depending upon the page from which the phone page was accessed. The Phone page provides for selection of a function through touch points displayed in the sub-menu portion of the display. The selectable touchpoints are: POLICE 403, MEDICAL 405, DATA PROVIDER 407, DIRECTORY 413, and MEMORY 415.

Detailed Description Text (30):

The primary data providers may include the public telephone company networks but may also include other entities. The data providers maintain data, including maps, telephone yellow page entries, and other information such as traffic and weather

reports. This information is maintained in a timely manner and is accessible through the use of data base methods well known in those in the art. Upon receiving a request for data, the data provider determines the nature of the data request, searches the appropriate data base or data bases, and transmits the requested information to the requesting device in the manner specified by the requesting device. The user, after the PCD receives the data as requested, disconnects, goes off line to review the information, deleting some, saving others, and storing other encoded information on the PCD. The user can now further edit the device's entire data base and decide a sequence for navigating to the locations listed in the various menus as waypoints. Thus users of the PCD can decide to navigate using the GPS features of the PCD and select certain waypoints and the order in which to proceed. By way of example, but not limited to same, users could select gas stations, banks, restaurants, shopping centers in unfamiliar areas, navigate today from one point of beginning and tomorrow continue navigating from another point of beginning, being assured that the device will always know how to get to various locations. Should the user require further locations to visit, the PCD is capable of obtaining new navigational data and adding to the already active route plan without having to completely start over.

Detailed Description Text (32):

FIG. 16 illustrates the Computer page. The Computer page is accessed by pressing the COMPUTER touchpoint 450 (shown in FIG. 6) on the Main Menu page. The Computer page allows the user to operate the device as a standard personal computer utilizing application programs of the type normally present on personal computers. As examples, the display of FIG. 16 provides for touchpoints in the sub-menu portion of the display for calendar date entry, notes, and organizer application programs. As with the other pages, the limited GPS information is also displayed.

Detailed Description Text (34):

The Receive Queue page displays stored received messages. The received messages may be displayed by reception type through selection of the transmission line type listed in the sub-menu portion of the display, the selectable types, through touch points displayed in the sub-menu 151 area, are: ALL 553, FAX 555, BEEPER 557, PHONE 559, COMPUTER 561 and RADIO 563. Selecting a type, will sort (by specified type) and display (by date and time) all messages received. By way of example, the radio queue contains GPS-encoded voice mail or digital files (containing information to various sites) provided by private third-party sources. The phone system queue contains previous calls with digital messages linked to web pages containing voice and video data. The computer which may be queued contains personal letters, calendars, notes and the like from more traditional sources or user created tagged files for storage. The fax queue contains traditional faxes which may illustrate maps with waypoints. The beeper mode queue contains received beeper messages (digital and voice).

Detailed Description Text (37):

As shown in FIG. 23B, the application module of the device is ported to a computer system not GPS capable, or merely not portable so as to have no need for a GPS receiver. The application module allows non-PCD based computer users to provide data to the data provider in the correct format, as well as receive data from devices or the data provider. This allows the non-device base computer user to track the location of devices and to collect information to be manually entered into a traditional GPS capable device as an aid in future trip planning.

Detailed Description Text (38):

FIG. 20 illustrates a list of GPS encoded data for a restaurant listing of restaurants in a requested area. This list may have been furnished by third parties or a data provider. The PCD has stored this information in digital format and is displayed on a GEO coded map, GIFF map or any other map the PCD stored in memory or receives from a third party or data provider. The information can be arranged by the PCD using criteria enabling the user unlimited access to the data. If the user chooses to navigate to these locations singularly or as a group, the GPS engine performs these functions, allowing a user of the device to accurately travel to the desired restaurant. As shown in FIG. 21, the PCD can use any scale of map or combinations and other types of maps as shown. The user of the PCD selects certain maps for storage and recalls same when needed for navigation. By way of example, the user's device could have a local Los Angeles street map, an interstate map (as shown in FIG. 21), and a New York city map in device memory. The user could navigate to the airport using the

- GPS functions and stored Los Angeles map, fly to New Jersey, rent a car and navigate to New York using the interstate map and, finally, find a specific restaurant in New York City by using the third map stored in PCD memory.

Detailed Description Text (40):

Using the map of FIG. 22, the user could navigate to a school, restaurant, bank, gas station, government office using the PCD to interpolate using spatial query techniques to find the best routes to each location. The PCD can re-collate the list for the most efficient route using the application and GPS engine modules. Using software programming techniques and math formulas, persons skilled in the arts will utilize spatial analysis queries and functions to determine best routing and "closest to" scenarios. In addition, centroid interpolation functions and match-rate comparison functions used by the GEO coding community will further enhance this application's ability to universally communicate with other systems.

Detailed Description Text (42):

FIG. 31 shows a web page screen with a data provider icon displayed on the device. Pressing or otherwise selecting the icon will enable a menu for the requester to specify a data request. Download will be in the form of a compressed digital data file that may include video, sound, or other digitally encoded data.

Detailed Description Text (62):

In step 1248 the PCD receives the locations of reporting devices. In step 1250 the PCD correlates the condition reporting device locations to the route information and forms a map display indicating the trail plot and the condition reporting device locations the process then returns.

Detailed Description Text (63):

FIG. 38 illustrates a display of a PCD displaying a trail plot with condition reporting device locations. As illustrated, the trail plot is indicated by a thick line. The thick line follows a first route 1262 until the first route intersects a second route 1260. The plot trail thereafter follows the second route. The locations of condition reporting devices 1264a-b are indicated along the route by star symbols (.star.).

Detailed Description Text (66):

FIG. 40 illustrates a PCD display showing information received from the condition reporting device. The information from condition reporting device includes a single digital photo 1284. The information received from the condition reporting device also includes traffic speed indications 1286 and current weather information, including temperature 1288 and wind speed 1289.

Detailed Description Text (68):

When the user selects COND RPT on the PCD display the PCD determines which condition reporting device is currently first on the list. The PCD then contacts the condition reporting device, as in the manual method, and displays the condition reporting device information, also as in the manual method. Once the PCD comes within the predetermined distance of the condition reporting device the PCD removes the condition reporting device from the list, and automatically requests information from the next condition reporting device along the route and displays such information.

Detailed Description Text (70):

FIG. 42 illustrates a process of the automatic sequence method for obtaining condition reporting device information. As in the automatic hand-off method, the PCD maintains a sequential list of condition reporting device locations along the route. The sequential list is ordered by condition reporting device locations along the route such that a first condition reporting device expected to be encountered along the route is placed first in the list, and the last condition reporting device expected to be encountered along the route is placed last in the list. Information from each condition reporting device in the sequential list is displayed for a period of time, in one embodiment ten seconds, and then the next condition reporting device in the sequential list is displayed. After information from the last condition reporting device in the sequential list is displayed, the PCD displays information from the condition reporting device first in the sequential list. As in the automatic hand-off method, as the PCD travels along the route, condition reporting devices are removed

- from the list when the PCD comes within a predetermined distance of the condition reporting device location.

Detailed Description Text (79):

FIG. 44 illustrates a block diagram of a local area transmission system for providing multimedia information using GPS navigation system coordinates. Data 1330 pertaining to a local geographic area is maintained by cellular telephone system providers or other entities. The particular local geographic locations are based on the locations of cell sites for cellular telephone networks, and the location specific data is transmitted by a cell site 1332 both over a standard radio broadcast system using a radio transmitter 1334 and by request to the cell site via a telephone access number. This data includes ASCII or other text formats, digital graphical images, including maps, digital photo-based images, and audio data.

Detailed Description Text (80):

In the radio broadcast system method of transmitting data, a first radio frequency is used to inform receivers of the radio broadcast of specific frequencies to be used to obtain particular types of data. The specific frequencies continually transmit data pertaining to services and information of the type specified for the particular frequency. The data includes text and graphics normally including names, addresses, phone numbers and GPS locational information for providers of the services of the type for that frequency. Additionally, digital GPS maps for the particular cell site broadcast location are also included.

Detailed Description Text (81):

Similarly, each cell site location is provided a specific telephone number. Users of cellular telephone-capable devices call the number and are in turn provided a list of telephone numbers for providing data equivalent to the data provided by the radio broadcast system. Two sets of phone numbers are provided. The first set provides voice audio information, and the second set provides information in digital form. In one embodiment, users of a PCD then direct the PCD device to obtain digital text, graphical maps, and GPS location information from the cell site telephone number. This information may then be used by the user of the PCD device to determine route information and to obtain data in the same manner as from other GPS tagged data providers.

Detailed Description Text (85):

The PCD also serves as a position monitoring device. To begin the position monitoring function the user selects the monitor on the PCD. Upon selecting the monitor function, the PCD displays a menu including INTERROG, AUTO-TIMED, and MOVE options. When the INTERROG function is selected the PCD will display an e-mail entry field allowing input by the user of an e-mail address. After the e-mail address is entered, the PCD responds to appropriate interrogatories by transmitting its current position. An appropriate interrogatory includes the security code active when the INTERROG mode was selected and an Internet e-mail address. Upon receipt of an appropriate interrogatory the PCD will transmit the GPS receiver determined latitude and longitude of the device to the e-mail address.

Detailed Description Text (88):

Thus, the PCD can be used to monitor the locations of individuals utilizing PCDs. For example, credit authorization agencies may make use of the location monitoring capability provided by the PCD in determining the validity of credit requests. FIG. 46 illustrates a method of credit authorization using the PCD. In step 1360 an individual makes a request for credit. This may be accomplished in a variety of manners, including "swiping" a credit card through a credit card reader at a gas station, supermarket, or a variety of other locations, or merely by providing a credit card to a retail clerk who thereafter requests credit authorization. The request for credit may be made to a credit card issuer, or may merely be a request for credit authorization by a credit reporting facility.

Detailed Description Text (90):

Additionally, PCDs can be used to monitor automobile locations and thereby discourage automobile theft or aid in the recovery of the automobile. For example, for an active PCD left in the INTERROG mode, upon discovery of the theft of the PCD or item in which the PCD is located, the user merely need to interrogate the PCD as to its location and

thereafter be immediately informed as to the device location, thus allowing for ease in locating and returning the device to the proper user.

CLAIMS:

1. A locating and map downloading system comprising:

a personal digital communicator comprising:

a display;

a receiver for receiving GPS signals;

a first transceiver;

a first modem coupled to the transceiver and to a first digital processor;

communicator input means for formatting a request for map information;

the first digital processor providing a means for processing the GPS signals and determining therefrom the location of the communicator, for transmitting via the first modem and the first transceiver the request for map information, for displaying on the display map information responsive to the request, and for displaying on the display the communicator location with reference to the map information; and

a map storage and transmitting device comprising a second transceiver, a second modem coupled to the second transceiver and a second digital processor, memory for storing map information in digital form, the second digital processor providing a means for determining which map information stored in the memory is responsive to the request and transmitting via the second modem and the second transceiver the map information responsive to the request, the map storage and transmittal device memory stores additionally stored data associated with discrete data points within the map information and such additionally stored data is transmitted with the responsive map information;

a condition reporting device comprising:

a processor;

a computer memory storing information, the computer memory being accessible by the processor and containing at least location identification information;

at least one weather condition sensor providing external information to the processor, the processor storing the external information in the computer memory;

a vehicular traffic condition sensor providing vehicular traffic information to the processor, the processor storing the vehicular traffic information in the computer memory; and

output means for transmitting information in the computer memory to the map storage and transmitting device;

wherein the map storage and transmittal device receives the information transmitted by the condition reporting device via the second transceiver and the second modem and the second digital processor stores the information transmitted by the condition reporting device in the map storage and transmittal device memory; wherein the map storage and transmittal device stores the information transmitted by the condition reporting device as additionally stored data associated with discrete data points; wherein the first processor determines a route to a selected marker; and

wherein the first processor transmits via the first modem and the first transceiver the location of the selected marker and a request for locations of condition reporting devices within a predefined distance of the selected marker.

WEST

 Generate Collection

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TITLE: Land vehicle navigation system with multi-screen mode selectivity

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Abstract Text (1):

A land vehicle navigation apparatus provides a present location map and various easily understood guidance information items in conformity with the environmental criteria of a route. The navigation apparatus includes information storage for storing map data as to route search, route guidance, and other guidance data, a present position detector for detecting the present position of the vehicle, an input device for inputting commands and information for route search and route guidance, and a display monitor unit for displaying a guidance screen with a map and other information relating to the route search and route guidance in a one-screen mode, or in a multiple-screen mode. A display controller responds to an input command via the input device, reads guidance data from the information storage, and controls the display of resultant read data on the display unit. Changes between the one-screen mode and the multiple-screen mode may occur with the screen of the one-screen mode of the display corresponding to one screen of the multiple-screen mode and a present-location map screen corresponding to another screen.

Brief Summary Text (3):

The invention relates to electronic navigation systems, and more particularly to a method and apparatus for providing navigation route guidance information in audible and/or visible form. The guidance information is provided to the operator of a land vehicle along a desired route between a start location and a desired destination as specified by the operator.

Brief Summary Text (5):

A variety of different navigation devices have been developed for providing the operator or user of a land vehicle with adequate guidance information along a route of travel. For example, one prior art device performs a route search to a target destination, attaining visible and/or audible guidance of a route to the destination by the use of maps. Another prior art device displays only a map covering a certain range with the vehicle's present position as its center point.

Brief Summary Text (7):

Another system is disclosed, for example, in Published Unexamined Japanese Patent Application (PUJPA) No. 4-335390. This system is capable of simultaneously providing the positional relationship of a destination and the present position of the vehicle and its surroundings by making use of dual screens which permit visual indication of a wide-area map covering both the present location and the destination along with a precise or detailed map around the present position.

Brief Summary Text (9):

With the system designed to display a wide-area map and detailed map using two divided screens, the vehicle operator may recognize the positional relationship of the destination and the present vehicle location in addition to the detailed information near or around the present location. However, the display of detailed information near the present vehicle location decreases by half in the display region due to employment of the two-screen division scheme. Another problem faced with this system is that recognizability of detailed on-map information displayed decreases with a reduction in

- the display scale (to enlarge a displayable coverage on the screen).

Brief Summary Text (15):

To attain the foregoing objects, the present invention provides a specific land vehicle navigation apparatus including an information storage device for storing map data as to route search, route guidance and other guidance data, a present position detector for detecting the present position of a vehicle, and an input device for entering commands and information for route search and route guidance. The apparatus also includes a display device for displaying a guidance screen of maps and other items relating to route search and route guidance either in a one-screen display mode or in a two-screen display mode.

Brief Summary Text (16):

The terminology "one-screen" as used herein may refer to the full screen area of the display device whereas the term "two-screen" may refer to simultaneous activity of multiple screens. As will be demonstrated in a later embodiment, such multiple divided screens may be two coexisting screen regions.

Brief Summary Text (17):

The apparatus further includes a display controller which responds to the entry of an input command via an input device for reading guidance data from the information storage device and controls the display of resultant read data at the display device. Importantly, the display controller performs an alternate change or switching between the one-screen display mode and two-screen mode with the screen of the one-screen mode of the display device corresponding to one screen of the two-screen mode while letting a present position map screen correspond to the remaining screen of the two-screen mode.

Detailed Description Text (2):

Referring to FIG. 1, the navigation apparatus includes an input/output (I/O) device 1, a present vehicle position detector device 2, information storage 3, and central processing device 4 (referred to as the "main controller" hereinafter). The I/O device 1 permits selection and execution of several information items as for route search and various other functions. The present position detector 2 operates to detect the present position of a land vehicle. The information storage 3 stores navigation data necessary for calculation or computation of routes, display/speech guidance data and programs (operating system and/or applications) as required for execution of route guidance, etc.

Detailed Description Text (3):

The main controller 4 is operatively coupled to the I/O 1, present position detector 2, and storage 3. The main controller 4 controls the entire system, and provides route guidance information audibly and visibly to a vehicle operator along a desired navigation route. In other words, controller 4 performs any necessary display/speech guidance procedure routines as required to execute route search routines and route guidance and provides controls over the entire system operation.

Detailed Description Text (5):

The data/instruction entry device may alternatively be a detachable or remote control unit, as necessary. The I/O device 1 also has an output section, which includes a visual display unit 12, a printer 13 and a speaker 16. The display unit 12 has its screen associated, with the touch panel 11. Display unit 12 visually indicates input data and automatically displays route guidance in response to a request from the vehicle operator. The printer 13 outputs data processed by the main controller 4 and data stored in the information storage 3. The speaker 16 audibly provides route guidance information and associated data by issuing guidance from prerecorded voices.

Detailed Description Text (7):

The display unit 12 may include either a color cathode-ray tube (CRT) monitor or color liquid crystal display (LCD) module, for visual representation of all the navigation data as color images. The various displays may involve a route display based on map data and guidance data processed by the main controller 4, a range diagram, a road-intersection diagram, and the like. The display unit 12 also simultaneously displays "virtual" buttons for use in setting any desired route guidance, for performing switching or changeover operations of guidance screens during route

- guidance, and selection/activation of various functions. In addition, intersection information for certain road intersections through which the vehicle is expected to pass is color-displayed on a "pop-up" range diagram window which will pop up on the screen when required.

Detailed Description Text (8) :

The display unit 12 is embedded inside the dashboard near the driver's seat in the vehicle, enabling a vehicle operator to view and verify his or her vehicle's present location and acquire necessary information concerning a route along which the vehicle is to travel. The touch panel 11 is positioned to correspond to the virtual function buttons displayed, thereby permitting execution of the above functions in response to a signal input through the vehicle operator's manual touch on any one of the buttons. The configuration of the input signal generation device, as structured from the buttons and touch panel 11, is known to those skilled in the art to which the invention pertains, and a detailed explanation thereof will hereby omitted from the description.

Detailed Description Text (9) :

The present-position detector 2 detects or receives information as to a present position of the vehicle. To this end, the present-position detector 2 may include an absolute azimuth direction sensor 24 including a terrestrial magnetism sensor or sensors, a relative azimuth sensor 25 including a vehicle steering sensor, gyro and the like, a distance sensor 26 for detection of the elapsed distance of travel based on the rotation number of wheels, and a global positioning system (GPS) radio receiver device 21 and associative communication device 5 which uses the GPS.

Detailed Description Text (12) :

More practically, stored programs include a route-search software program for defining a route and setting a destination and a waypoint based on both position information from the present-position detector 2 and an input signal from the touch panel 11, a program for executing conversion of the desired route data based on traffic information as acquired by the communication device 5 and reexecuting the route search program, a route information conversion software program for drawing a desired route with 3D visual effects, a program for determining the timing and content of a speech output along the route, etc. Respective navigation functions may be performed by activating these programs as stored in the information storage 3.

Detailed Description Text (14) :

Moreover, the main controller 4 includes an image memory for storage of image data for use in the screen display. A digital image processor 45 is provided to obtain image data from the image memory on the basis of a display control signal from the CPU 40 for image processing and output to the display unit 12. A digital voice data processor 46 responds to receipt of a speech output control signal from the CPU 40 for combining by superimposition techniques speech, audible phrase, self-explanatory sentence or voice message, etc., as read from the RAM 42 and converts speech into a corresponding analog signal for output to the speaker 16. A communication interface 47 transmits and receives input/output communication data. A sensor input interface 48 is connected to obtain a sensor signal of the present-position detection device 2. A clock 49 writes a date and time into internal dialog information.

Detailed Description Text (15) :

In the main controller 4, when data acquired by the present-position detector 2 is input via the sensor input interface 48, the CPU 40 attempts to calculate the coordinates of a present position when a predetermined time has elapsed, and then temporality writes or programs the position into the RAM 42. The coordinates of this present position is a result of the execution of map-matching processing in view of any possible detection errors of respective kinds of data items. An output value of each sensor is always subject to correction. The route guidance is performed with a screen display and audible speech output while the presence or absence of the speech output remains selectable by the vehicle operator.

Detailed Description Text (17) :

The overall flow of system processing of the navigation apparatus is shown in FIG. 3. First, initialization processing is performed causing the CPU 40 to read a navigation program out of the CD-ROM. The program is then stored in the flash memory 41 (step S1)

Then, in deference to this navigation program, the present-position detector 2 detects a present position and allows its nearby-region map to be displayed with the detected present position being identified as the center position (step S2). Next, a destination is set using a telephone number, administrative address, facility name, registration point, etc. (step S3). Thereafter, route search processing is conducted from the present position to the destination (step S4). More than one road segment along the route may be displayed and set as guidance road number data, as shown in FIG. 4. Upon determination of a route, display and/or speech output of route guidance occurs until the vehicle reaches the destination and the present-position detector 2 tracks the changes in a present position (step S5).

Detailed Description Text (31):

Assume here that a map and a schematic diagram are prepared as display screens. Also assume that the display mode is changed between the one-screen mode and two-screen mode. In this case, as shown in FIG. 8, it is possible to selectively change between a map or a schematic diagram for display in the one-screen mode, and also change to display either a combination of maps and map or a combination of a schematic diagram and a map in the two-screen mode. Here, as has been described previously, the right-side screen in the two-screen mode is used for displaying guidance maps. This screen displays a present-location map or displays an enlarged intersection diagram screen when the vehicle nears an intersection where turn is expected. On the other hand, the left-side screen is assigned to display the various-function screens of a map display, schematic diagram display, etc. When a change occurs between the one-screen mode and two-screen mode, the screen of the one-screen mode corresponds to the left-side screen of the two-screen mode.

Detailed Description Text (38):

The schematic diagram screen is discussed below. This screen is used, for example, in cases where a road is line-drawn using curves, the road is displayed with 3D visual effects by line-drawing a plurality of lines on the right and left sides of a center line of the road, as shown in FIG. 11A. With such a schematic diagram screen display, it becomes possible to confirm the curvature of the road on the screen in a manner similar to that of the vehicle's actual turn. Also, in addition to a 3D drawing of the road as shown in FIG. 11B, a plurality of route information items are displayed on a drawn map, for forward positions up to a specified distance from the present vehicle position.

Detailed Description Text (39):

In addition, several names or titles are displayed in the forward direction along the direction of travel, such as interchanges, junctions, parking areas, etc. Distance remaining to a present vehicle position to the certain title displayed, highway information concerning road facilities such as gas stations, are also displayed.

Detailed Description Text (40):

For displaying such a schematic diagram screen, a land vehicle navigation apparatus as already proposed by the same applicant (see PUJPA Nos. 7-217865, 8-107921, etc.) may be employed. Note here that in the screen shown in FIG. 11B, while the information for "MORIYAMA PA", is displayed which is the nearest parking area from a present vehicle position, if the user designates "KASUGAI IC" or "KOMAKI JCT", which are highway junctions further away, the system then displays the "MORIYAMA PA" then display the highway information of "KASUGAI IC" or "KOMAKI JCT." Accordingly, with this schematic diagram screen, since a complicated map is not present while 3D-displaying a present vehicle position and associated specific route information concerning objects of the present position, it is possible to easily confirm the objects while driving.

Detailed Description Text (48):

In addition, the schematic diagram screen with 3D visual image effects and the architectural structure shape map screen are displayed together along with a present location map screen in the two-screen mode. This may be modified so that where a characteristic object is present ahead of the present vehicle position, other kinds of screens are displayed containing information relating to the object, including photographs, overview diagrams, etc. Alternatively, the schematic diagram screen display any commercial navigation program, while the architectural structure shape map screen may be a city map, neighborhood map or a superimposed image thereof. Further, the type of buttons to be displayed at the lower region of the screen should not be

limited to the illustrative examples only, and may be freely modified when appropriate.

CLAIMS:

1. A navigation apparatus, comprising:

storage means for storing information for use in providing route guidance to a vehicle operator, said information including map data for route search and route guidance, as well as other guidance data;

detector means for detecting a present vehicle position;

input means for inputting commands and information for route search and route guidance;

display means for visually indicating maps and guidance images relating to route search and route guidance, in a specified display mode being one of a full-screen mode and a multiple-screen mode that permits simultaneous presentation of a plurality of divided screens including at least a first screen and a second screen;

display control means for changing the full-screen mode to the multiple-screen mode in order to correspond at least a portion of a screen of the full-screen mode to the first screen of the multiple-screen mode and display a navigation related image on the second screen of the multiple-screen mode;

wherein when changing to the multiple-screen mode during route guidance, the display control means is responsive to receipt of criteria of a present vehicle position, for displaying on the first screen, one of a schematic diagram, representative of a travel image with three-dimensional visual effects, and an architectural structure shape map image, indicative of a shape of an architectural structure.

4. An apparatus for calculating a desired geographical route between locations and for providing navigation route guidance to an operator of a land vehicle, the apparatus comprising:

storage means for storing information including relevant road maps data for use in effecting route search and route guidance, and other guidance data;

detector means for detecting a present vehicle position;

input means for allowing the operator to enter commands and data for route search and route guidance, including route preference for a route or routes to be calculated;

display means for providing a visual display of reference images concerning route search and route guidance, including maps, graphics and messages; and

display control means operatively coupled to the storage means, the detector means, the input means and the display means, for controlling operation of the display means for changing between a full-screen mode and a multiple-screen mode and permitting simultaneous presence of a first and a second divided screen;

wherein, the display control means responds to an entry of an input command via said input means for reading guidance data from the storage means and for controlling display of read data at the display means by causing the display means to visually indicate a main reference image representative of the read guidance data in the full-screen mode and, in the multiple-screen mode, causing the display means to continuously display at least part of the main reference image on the first screen while letting the second screen display a subsidiary reference image indicative of automatically selected additional information that is pertinent to the main reference image.

5. The apparatus of claim 4, wherein where the display means visually displays a road map containing a present vehicle position at or near a center thereof in the full-screen mode, the display control means automatically selects, as the subsidiary

reference image displayed in the multiple-screen mode, a self-explanatory image representative of detailed road system conditions around the present vehicle position.

7. The apparatus of claim 5, wherein the present vehicle position includes one of a present-location map and a detailed wide-area map.

8. The apparatus of claim 5, wherein the self-explanatory image includes a depiction reflecting planar shapes of several architectural objects along a road path for travel around a present vehicle position in cities or towns.

14. The apparatus of claim 13, wherein the display control means comprises a digital image processing device.

15. The apparatus of claim 14, wherein the display means includes a color monitor display unit.

16. The apparatus of claim 15, wherein the input means includes an electrical touch-sensitive member operatively associated with the color monitor display unit.

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L15: Entry 40 of 43

File: USPT

Apr 2, 1996

DOCUMENT-IDENTIFIER: US 5504482 A

TITLE: Automobile navigation guidance, control and safety system

DATE FILED (1):19930611Detailed Description Text (30):

A vehicle control system 52 includes electronic means for controlling various vehicular actuators for both primary and superseding vehicular control. Preferably, the vehicle control system 52 includes an engine system 54 controlling, for example, vehicular speed, a braking system 56 controlling, for example, anti-lock braking, a stabilization system 58 controlling, for example, suspension stiffness, and a steering system 60 controlling, for example, the direction of all four wheels. The guidance, control and safety system of the present invention would also include a vehicle electro-mechanical system 62 having a plurality of sensors 64 and actuators 66 for actuating and sensing the vehicular control functions of the vehicle such as engine, braking, suspension and steering control, and for actuating and sensing steering, throttle and braking manual manipulation. The driver control systems 40, 42 and 44 are used to sense driver manipulation, and to provide superseding control over the steering wheel, brake pedal and throttle pedal so as to provide the driver with bio-sensual feedback as to the current operation of the vehicle. The driver acts upon the steering wheel, throttle pedal and braking pedal, not shown, which in turn drive actuators 66e, 66f and 66g for providing primary control of the vehicle through the vehicle control system and through actuators 66a, 66b, 66c and 66d which control the vehicle. The vehicle dynamic control system 26 receives obstacle information from the obstacle detection system 36, receives acceleration and velocity information from the position system 22, receives vehicle driver manipulation information from the driver control systems 40, 42 and 44, including information derived from the sensor 64e, 64f and 64g, and receives vehicle operation information from the vehicle control systems 54, 56, 58 and 60, including information derived from the sensors 64a, 64b, 64c and 64d. The systems 40, 42, 44, 54, 56, 58 and 60 provide feedback to the vehicle dynamic control system 26 for stable dynamic control, based primarily on driver manipulation and secondarily on dynamic inertial, optical and operating condition sensing.

Detailed Description Text (43):

The route planning processor 70 also receives broadcasted real-time traffic flow and road incident information for the local area through the radio data system 28. This information is preferably encoded for minimum transmission time and is periodically retransmitted with updates as traffic conditions change. The radio data system message decoder processor 76 processes received traffic flow messages and sends the received decoded information to the route planning processor 70 for analysis in route changes and display alerts. Preferably, only traffic flow and road incident information which is pertinent to the driver and the planned route to the destination will be selectively processed by the route planning processor 70 which may display additional information to the driver, in addition to map roads, planned routes and current position. The display 48 may flash warning road blockages, for example, an accident block, or commercial advertising, for example, a motel location, with suitable display designations, for example, like those found along freeway routes. The display 48 may display these designations along a planned route or in close proximity to a planned route. The display could alternatively provide synthesized voice messages of blockages or advertisements as the driver proceeds along the planned route.

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L11: Entry 30 of 53

File: USPT

Feb 2, 1999

DOCUMENT-IDENTIFIER: US 5867780 A

TITLE: Access free wireless telephony fulfillment service system

DATE FILED (1):19971218Detailed Description Text (42):

FIG. 5 describes the integration of the wireless telephone or specifically the mobile wireless transmitter and receiver 210 to a vehicle transporting the caller. The wireless telephone may be connected by a hardwire interface to a vehicle's central key pad 211 located on the steering wheel or other convenient location. Such connection will permit easier use of the invention and will allow for visual confirmation of system functions through the vehicle's heads-up-display capabilities, at 212.

Detailed Description Text (44):

Yet another arrangement provides that the wireless telephone be connected by a hardwire interface to a vehicle's video terminal 214 to allow display of telephony functions or the receipt and display of video messages sent by wireless means to the user. A hardware connection can also be made to a vehicle's positioning system 215, such as GPS, and automobile mapping system 216 in order to facilitate communication of position data or to allow advertisers to transmit data containing directions or location-related information. Integration of the wireless telephone 210 to the vehicle's safety system 217 provides for automated transmission of emergency messages. When coupled with the vehicle positioning system 215, such emergency messages may contain the specific location of the troubled vehicle or user. Vehicle location data is often valuable for both caller purposes (e.g., emergencies) and cellular system efficiencies, as evidenced by the systems disclosed in U.S. Pat. Nos. 5,327,144 and 5,343,493. Cellular location can be determined by one or more of the following means:

Detailed Description Text (51):G. Vehicle based locations systems.Detailed Description Text (69):

(H) To sub-cell level from subscriber-input data received from personal observation of external information including but not limited to numerical data displayed on billboards or other visible advertising media, instructions received over broadcast radio channels, information gathered from other visible sources, information received from fellow passengers in the vehicle equipped with the mobile radio terminal; other personal third party sources; information previously provided to the subscriber as part of commercial agreements.

Detailed Description Text (71):

Integration of the wireless telephone to the Intelligent Vehicle Highway System (IVHS) 219 will provide enhanced features and further communication abilities utilizing the receiver and transmitter of the wireless phone. The wireless telephone may also be connected by hardwire interface to a vehicle's printer or other mobile facsimile or printer at 218 to allow printed transmissions from advertisers, including coupons, etc. Finally, the wireless telephone may be connected by a hardwire interface to a vehicle's radio 220 to allow audible display of telephony functions or the receipt and display of audio messages sent by other wireless means to the user.

Detailed Description Text (90):

The system's target or fulfillment center also includes a customized administrative

• database 405 which notes the time of calls, duration of calls, location of caller, number of calls for each identifier, monitors volume and other physical parameters of a call, and administrates billing of calls. Other database information which may be stored and/or updated includes a caller's social security number, address, credit or debit card number, sizing and credit history. In those variants of the present invention which utilize ISDN technology, the target location must use an ISDN compatible switch with T1 or T3 cards, such as the Varilink CSU Model 551 or Northern Telecom's SL1 Meridian Model Option 81. ISDN processing also requires Extended Super Frame (ESF) Binary Eight Zero Suppression (B8ZS) signaling.

CLAIMS:

10. The service fulfillment system of claim 1 wherein said first wireless transmission means comprises a telephone and wherein said telephone is connected to a vehicle position system.

22. The service fulfillment system of claim 13 wherein said first wireless transmission means comprises a telephone and wherein said telephone is connected to a vehicle position system.

WEST

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L15: Entry 39 of 43

File: USPT

Sep 17, 1996

DOCUMENT-IDENTIFIER: US 5557268 A

TITLE: Automatic vehicle recognition and customer automobile diagnostic system

DATE FILED (1):

19950224

Brief Summary Text (2):

The present invention relates to a system and method that automatically recognizes a vehicle, determines if parts of the vehicle are functioning properly, and displays this information to the driver at various positions in the service station. Additionally, other promotional information about the customer or the vehicle can be tracked or displayed.

Brief Summary Text (3):

In this manner, the customer can decide the necessity or frequency of vehicle maintenance, and whether to make purchases based on the promotional information displayed.

Brief Summary Text (8):

The display subsystem displays a greeting to the customer, displays vehicle diagnostic information, and displays promotional information. These displays are visible in ambient sunlight and can be viewed by customers while fueling.

Brief Summary Text (9):

The data processing and control subsystem comprises a network of computer processors that obtain information from the vehicle identification equipment and sensor assemblies, determine where to display the customer greeting, diagnostic, and promotional information, and then generates a presentation for the customer. This subsystem maintains a customer database which allows for tracking the frequency of customer visits and identification of recurring problems with the vehicle.

Brief Summary Text (10):

The method of the present invention allows for automatically identifying and diagnosing a vehicle, and displaying the information to the driver. The method includes the steps for identifying a vehicle as it is being examined for mechanical problems, identifying the driver of the vehicle by examining a database which associates the characters emitted by the vehicle transponder with the driver's name, determining where the vehicle has stopped for fueling or other services, and displaying a greeting, diagnostic information, and promotional information to the customer.

Detailed Description Text (9):

The transponder (11) is attached to the vehicle (8) and is activated when it is within the "read distance" of antennas (1) and (3). The "read distance" is adjustable so that vehicles at adjacent or nearby fueling positions are not detected. Upon activation, the transponder emits an electromagnetic wave that is modulated in a way that conveys a unique sequence of data to the controller (5). The emitted signal is received by antenna (3), and is filtered and amplified by the preamplifier (4). The processed transponder signal is then passed to the controller (5) for detection and decoding.

Detailed Description Text (22):

FIG. 3e describes the tasks performed by Boxes (3) and (4) in FIG. 1b. FIG. 3e shows a flowchart of the method used to perform the preferred embodiment in the area where the

vehicle is fueled, or the customer is provided with some other service. In this embodiment, some functions are performed by the Pump Island Processor, shown as (4) in FIG. 1b, and some by the Pump Server, shown as (3) in FIG. 1b. The method starts with an initialization of the controller (1), in which the vehicle identification system is powered, cleared of any fault, and readied for activation. The pump island processor then checks its input buffer for input (2). If there is no input buffer activity, the pump island processor keeps checking the buffer at regular intervals (3). If there is input in the buffer, the pump island processor reads the contents, character by character (4), until the end of message (5). Once the entire message has been read, it is parsed (6). If the message indicates that the controller is looking (7) for a transponder, the pump island processor returns to the start of step (2). If the message is any other sequence of characters, a transaction file is created (8) which includes the location of the vehicle, the vehicle identification character sequence. The pump island processor then resets the controller (9) and returns to step (2). The pump server processor then examines the customer information file (10) to determine the customer name and other information associated with that vehicle identification sequence. If no associated information is found, this processor waits for another transaction file. If associated information is found, the pump server processor waits a period of time to see if another transaction file is created with a redundant vehicle identification sequence. In this manner the vehicle is tracked from one service area to another. If the pump server detects the presence of a file that contains a different location, and the same vehicle identification sequence within the time period, the processor waits for the duration of the time period again (12). If there is no other transaction file written containing the same vehicle identification sequence during the time period, the pump server writes a display information file (13) that contains the vehicle identification sequence, the result of the vehicle diagnostic tests, the date and time. The pump island processor periodically checks to see if a new display information file has been generated. If one has been created, the pump island processor formats the data contained in the display information file, and then displays the formatted information as a sequence of graphics and text screens to the customer. When finished, it waits for a new display information file.

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L15: Entry 35 of 43

File: USPT

Sep 9, 1997

DOCUMENT-IDENTIFIER: US 5664948 A

TITLE: Delivery of data including preloaded advertising data

DATE FILED (1):19941011Drawing Description Text (10):

FIG. 8 illustrates a background process within the information device providing advertisement presentation in response to selected presentation conditions.

Detailed Description Text (7):

FIG. 1 also illustrates a global position system (GPS) satellite 50 providing transmission 52. Details and use of GPS transmission 52 to determine location of a GPS receiver carried by vehicle 10 are well known. Use of GPS transmission 52 under the present invention is by incorporation of a GPS receiving device into travel information device 40 and collection of current vehicle 10 position therewith as described more fully hereafter.

Detailed Description Text (10):

FIG. 2 illustrates in block diagram travel information device 40. In FIG. 2, a microprocessor 60 orchestrates generally operation of device 40. While referred to generally herein as "microprocessor" 60, it will be understood that such device includes additional supporting hardware features such as analog-to-conversion and digital-to-conversion and other such related input/output hardware required to support the features described herein. Data radio receiver 62 couples antenna 42 to microprocessor 60. As contemplated under the preferred form of the present invention, data radio receiver 62 comprises essentially a paging system receiver operating under the paging system. Thus, the paging system paging device provided as receiver 62 serves as a data terminal collecting data broadcast 26 and providing to microprocessor 60 digital advertising, e.g., text or digitized voice data. A voice radio receiver 64, also coupled to antenna 42, receives the voice broadcast 22 and delivers a voice signal 66 to microprocessor 60 and to an amplifier 68 driving speakers 70. Application of voice signal 66 to microprocessor 60 includes appropriate analog-to-digital conversion whereby microprocessor 60 converts, when necessary, voice signal 66 to a digitized recording thereof. Microprocessor 60 tunes voice radio receiver 64 and data radio 62 by way of a tune control signal 72. Thus, microprocessor 60 establishes coordinated tuning for voice radio 64 and data radio 62 whereby coordinated voice and data broadcast 22 and 26 are received by radios 64 and 62, respectively.

Detailed Description Text (12):

An advertisement presentation block 104 receives from microprocessor 60 an index value and has direct access to the memory resource 90 for presentation of advertisements stored therein. Thus, microprocessor 60 queues advertisement presentation by providing a sequence of index values to the advertisement presentation block 104. The advertisement presentation block, in turn, accesses memory resource 90 by reference to a queued index value and collects the requested advertisement record 400 for presentation. As may be appreciated, message presentation block 104 reacts to the record 400 data type to determine how the advertisement data is to be interpreted and presented, i.e., selects one or both of display 100 and speakers 70 for presentation. Thus, advertisement presentation block 104 may deliver text type data taken from a record 400 to display 100 for presentation thereon, or may employ digitized sound data to produce an audio signal suitable for application to amplifier 68 and presentation on speakers 70. Additionally, advertisement presentation block 104 may be provided

; with, for example, text-to-speech conversion capability for presentation of text type data found in one of records 400 upon speakers 70. In any case, advertisement presentation block 104 responds to the content, i.e., data type, of each record 400 queued for presentation and selects an appropriate mode of presentation by way of display 100 or amplifier 68 and speakers 70.

Detailed Description Text (13):

A global position system receiver 80 receives the transmission 52 from global position system satellite 50 and delivers to microprocessor 60 a current vehicle location 82. In this manner, microprocessor 60 requests from global position system radio receiver 80 a current vehicle location and receives in return the current vehicle location 82.

Detailed Description Text (14):

Display 100 presents, for example, tuning and station selection information relative to the voice radio receiver 60 to provide an FM radio capability wherein the operator of vehicle 10 manipulates input controls 102, i.e., volume and station tuning, to listen to a selected voice broadcast 22. Display 100 further presents, advertising text as taken from advertisement records 400 having a text type data field.

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L15: Entry 24 of 43

File: USPT

Dec 7, 1999

DOCUMENT-IDENTIFIER: US 5999126 A

TITLE: Position measuring apparatus, position measuring method, navigation apparatus, navigation method, information service method, automotive vehicle, and audio information transmitting and receiving method

DATE FILED (1):

19970721

Brief Summary Text (5):

Conventionally, a navigation system utilizing a position measuring system using artificial satellites called a GPS (Global Positioning System) has been widely known and has already been in widespread use in vehicles. In addition, a so-called hybrid type navigation system for navigation based on information from a gyro sensor or the like has also been used extensively in tunnels, valleys between tall buildings in town, and so on, where GPS radio wave from a satellite do not reach. A variety of receivers have been developed for position measuring systems using the GPS for applications other than in vehicles.

Detailed Description Text (12):

The present invention is intended to solve problems of these previously proposed techniques, and solution of the problems is achieved by an apparatus having the configuration illustrated in FIG. 1. Explaining below the configuration thereof, a GPS receiver unit 5 connected to a GPS antenna 4 receives a GPS signal from a GPS artificial satellite and decodes position data. A PHS antenna 9 for transmitting and receiving a PHS radio wave to and from a PHS base station is also connected to a PHS receiver unit 6 and a PHS transmitter unit 7 through an antenna sharing unit 10. The PHS receiver unit 6 performs reception processing for extracting position data of a base station from a PHS signal received by the antenna 9. The PHS transmitter unit 7, in turn, performs transmission processing for a variety of information and transmits the information from the antenna 9 to a base station (note that the transmitter unit 7 may be omitted).

Detailed Description Text (14):

A signal received by the GPS receiver unit 5, a signal received by the PHS receiver unit 6, and a signal related to the certainty detected by the GPS certainty detector unit 8 are supplied to a control unit 12, serving as a system controller of the apparatus, for coordinating a variety of information supplied thereto. The control unit 12 is connected with a position calculation unit 11 which generates a specific position from the respective received signals such as latitude and longitude data. Alternatively, data indicative of a position such as a sheet number of a map may be generated in place of the latitude and longitude data. In this case, if a signal for position measuring is available from only one of the GPS receiver unit 5 and the PHS receiver unit 6, a position is calculated based on that signal. On the other hand, when signals are available from both of them, a signal to be used is selected with reference to the certainty detected by the GPS certainty detector unit 8. More specifically, if the certainty of the position measuring using the GPS, detected by the GPS certainty detector unit 8 is low, the ID of a base station received by the PHS receiver unit 6 is used to determine the position at which the base station exists, and the determined position is treated as the position derived by the position measuring. If the certainty is high, a position measured signal by the GPS is used to calculate the position. Incidentally, if data received by the PHS receiver unit 6 includes map data and traffic information, the data is stored in a map data storage unit 14 or the like.

Detailed Description Text (26) :

First, the value of GDOP is evaluated on the basis of detection in the GPS certainty detector unit 8 to judge whether or not it is within a predetermined range (step 101), and it is determined that a GPS receiving condition is satisfactory when it is within the predetermined range. When it is determined to be satisfactory, a signal received by the GPS receiver unit 5 is fetched (step 102), and a position calculation is executed in the position calculation unit 11 based on the fetched signal (step 103). Then, the calculated position is decided to be the current position of the automotive vehicle 1 (step 104).

Detailed Description Text (29) :

On the other hand, if it is judged at step 111 that the base station ID is not satisfactorily received, the value of GDOP is evaluated on the basis of detection in the GPS certainty detector unit 8 to judge whether or not the value is within a predetermined range (step 115), and it is determined that a receiving condition of the GPS is satisfactory if it is within the predetermined range. When it is determined to be satisfactory, a signal received by the GPS receiver unit 5 is fetched (step 116), and a position calculation is executed in the position calculation unit 11 based on the fetched signal (step 117). Then, the calculated position is determined to be the current position of the automotive vehicle 1 (step 114).

Detailed Description Text (39) :

Conversely, if it is determined at step 136 that it is not a special news, it is next judged whether or not the signal is information such as advertisements, events, or the like (information on tourism, information on events at stores, and so on near the current position) (step 138). Here, if it is determined to be information such as advertisements, events or the like, associated information is displayed in the form of characters 13e in a corner of the screen on which a map or the like is displayed, for example, as illustrated in FIG. 13D (step 139).

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L15: Entry 23 of 43

File: USPT

Jan 11, 2000

DOCUMENT-IDENTIFIER: US 6013007 A
TITLE: Athlete's GPS-based performance monitor

DATE FILED (1):
19980326

Detailed Description Text (19):

FIG. 9 is a perspective view of a personal computer 701 connected to the Internet 803. By way of example, the computer 701 is connected via a modem 902 and a standard telephone line. Alternative means of connecting the PC 701 to the Internet 803, such as cable modems, ISDN lines, T1 lines, and so forth, may be used. By way of example, the PC's monitor screen 901 is shown displaying an Internet World Wide Web browser window displaying an Internet web page for comparing an athlete's performance to other participating athletes from around the United States of America. The lower left-hand corner of this computer screen displays an advertising banner 903 specifically designed for and aimed at participating athletes.

Detailed Description Text (29):

During the exercise session, the GPS receiver module 604 continuously determines the athlete's geographical position and stores it in the memory 608 along with other information such as the date and time that each position was acquired. From these positions and times, performance data such as elapsed distance, current and average speeds and paces, calories burned, miles remaining, and time remaining are calculated. Based on this data, recommendations to increase or decrease level of effort to meet pre-set performance targets are then determined.

CLAIMS:

28. A system as recited in claim 24, wherein said Internet web site is adapted to display advertisements.

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L15: Entry 19 of 43

File: USPT

Jul 18, 2000

DOCUMENT-IDENTIFIER: US 6091956 A
TITLE: Situation information system

DATE FILED (1):
19970612

Brief Summary Text (17):

Finding the location of radios, including transmitters and transponders, through various methods including chronometrical, i.e., time measuring, triangulation is well understood. The U.S. Global Positioning by Satellite (GPS) System and the Russian Global Navigation Satellite System (GLONASS), collectively referred to herein as the satellite positioning system or GPS, are comparatively recent permutations of these methods which provide precise time signals for mobile receivers to compute their location. GPS signals are often obscured in environments of hills or tall buildings.

Brief Summary Text (28):

In the preferred embodiment, a situation information system consists of at least one mobile computer with multiple transmitters and receivers, i.e., radios, a known-location information service provider including one or more radios, accessible network, computer equipment with memory, which term includes storage, drives, and RAM units, and computer programs to provide for efficient situation information exchange between them. The mobile computer's transmitters and receivers include a receiver for satellite positioning system signals, such as GPS or GLONASS, a transceiver for wireless voice and data telecommunications capability, and a transponding transceiver for location finding in topographically complex, that is, mountainous areas or areas surrounded by buildings, e.g., in urban "canyons" and those enclosed within buildings, such as shopping malls.

Brief Summary Text (38):

In such a scenario, a local extranet and customer-carried display device could provide a new type of promotion and advertising medium. For example, knowing a person's location, the networked store could increase customer traffic by transmitting special offers directly to the willing customer's device. An additional benefit is that customers can receive services like maps and other aids to help them find their way around the store or shopping mall to the desired merchandise or store, respectively.

Detailed Description Text (20):

The basic situation information device 2b shown in FIG. 4, having been connected or logged on to the system and its position being known by the situation information system of FIG. 3, operates by receiving information via antenna 14i, conveying the information to the user via display 4b and speaker 7g, the characteristics of which can be changed by the user via controls including control 7f. As the device user's mapped location, shown on the display by device location and direction symbol 6f, approaches within a selectable distance of environment proximate information features, such as retail store site 3e, an advertising message such as service provider menu 6h, or an optional advertising message (not shown), would appear on the display awaiting the user's request for information or services. This operational description assumes the user has initiated a service-provided keyword search for information about "Hiking Gear". Should the user also wish to know, for example, what the merchant's current, short-term offers are, the user would select the menu portion entitled "1 hr. Specials" which causes sub-menu 6i to appear on the display showing categories of merchandise included in the aforementioned offers. Search hit icon 5d, with "Hiking Gear" message which is similar in use to that of search hit icon 5b above, is shown

overlapping the portion of the submenu entitled "Children's" which indicates that a 1 hr. Special in the Children's Dept. offering Hiking Gear is currently in effect. The system user, indicated by device location and direction symbol 6f and which may be a mappable hypertext item as described below in FIG. 12, may orient himself or herself globally by north direction arrow 6g, by building occupant information such as store 3e and bank 3f, by street name 3g on map, and sidewalk curb 3h. User may elect to receive information from other service providers by operating a visit list program (shown in FIG. 13), in which case, executable selecting visit list control icon 5c would cause the first site's information to be presented on the display. Additionally, the user may change or scroll the portion of map in view on the display by pressing the appropriate arrow of display scroll icon 8c to move the view in the arrow's direction.

Detailed Description Text (52):

Situation information from the service provider, including map-referenced information, advertisers' and merchants' messages, weather, news, including traffic congestion graphical data and accident reports, if appropriate to user's situation, filters, etc., are received at RECEIVE INFO. FROM PROVIDER <129>, at which point device 2c will update its data at UPDATE LOCAL SYSTEM <130>. Program <120> next proceeds through a series of evaluations of user's actions including whether user's location has changed at LOCATION CHANGED? <131>, which, if evaluating to YES, corresponds, for example, to the equivalent of the user having generated additional data and processing loops back to SELECT FILTERS AND OPTIONS <127>, and, if the filters and options remain unchanged, continues to send data in aforementioned instruction <128>. However, should user's location remain unchanged within the limits set by service provider according to computational bandwidth constraints, for example, or through the user's selection, and evaluation <131> evaluate to NO, program <120> next evaluates whether or not the user's device has recorded a new request for services, including information requests, at REQUEST SERVICES? <132> in which a YES evaluation causes processing to loop back to instruction <127>. Next, should no services or information be requested and evaluation <132> evaluate to NO, opportunity to change providers is offered with evaluation GO TO NEW PROVIDER? <133>, which, should user elect YES, causes the program to loop back to LOG ON TO SERVICE PROVIDER <123>. Should evaluation <133> evaluate to NO, user is queried as to whether or not the current session should be continued at evaluation CONTINUE SESSION? <134>, which, if evaluating to YES, causes processing to loop back to REQUEST SERVICES? <132>. Finally, should evaluation <134> evaluate to NO, program <120> may be terminated at RETURN <135>.

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L15: Entry 16 of 43

File: USPT

Aug 1, 2000

DOCUMENT-IDENTIFIER: US 6098048 A

TITLE: Automated data collection for consumer driving-activity survey

DATE FILED (1):19980812Brief Summary Text (9):

U.S. Pat. No. 5,406,271 to Sonnendorfer and Wieth ("the Sonnendorfer and Wieth '271 patent") discloses an infrared communication system for shopping carts in a multi-department self-service store. Each shopping cart of the system is equipped with a mobile transceiver/display unit which has an infrared transceiver, a digital memory, and a display. The mobile transceiver/display unit can receive infrared transmissions encoding display information for storage in the memory of the unit and display on the unit's display. Information displayed on the display of a mobile transceiver/display unit mounted on a shopping cart can be viewed by a customer pushing the cart. Each department of the store has a departmental infrared transceiver unit with a digital memory located in the department for storing and transmitting advertising and other display information specific to the department for display on the mobile transceiver/display units on shopping carts in the vicinity of the departmental transceiver unit. The mobile transceiver/display units on the shopping carts are adapted to send a confirmation signal back to the departmental infrared transceiver unit for storage in the memory of the departmental unit to provide a record confirming receipt and display of the display information from the departmental unit. As discussed at column 3, lines 6 through 45 of the Sonnendorfer and Wieth '271 patent, each mobile transceiver/display unit is provided with an identifier code number which can be either automatically broadcast or sampled upon activation by the departmental infrared transceiver units. By recording the code numbers of system carts passing in the vicinity of the various departmental transceiver units and the times the code numbers were received, the system of the Sonnendorfer and Wieth '271 patent can determine the route taken by each customer who pushes a shopping cart through the store and how long each cart remained in the various departments of the store.

Brief Summary Text (26):

In one particularly preferred embodiment of the method of obtaining consumer driving-activity market research information of the invention, the automatic vehicle-location tracking gear on each subject trackable motor vehicle includes a global positioning system ("GPS") satellite receiver for receiving GPS satellite signals for determining location geodetic coordinate data specifying the approximate location of the subject vehicle at the time the satellite signals were received.

Brief Summary Text (27):

In one preferred embodiment of the method of obtaining consumer driving-activity market research information of the invention, the data processing system is located in a central station and is in communication with wireless receiver gear. In such preferred embodiment, each subject trackable motor vehicle is equipped with wireless transmitter gear connected to the automatic vehicle-location tracking gear. The steps of automatically generating and storing time-annotated vehicle-location data for each subject trackable motor vehicle and each trip portion of the sample group of trip portions in such preferred embodiment includes continually transmitting signals encoding vehicle-location data generated by means of the automatic vehicle-location tracking gear from the wireless transmitter gear on the subject vehicle to the wireless receiver gear and storing time-annotated vehicle-location data for the trip portion in digital data storage of the data processing system at the central station.

Preferably, the wireless transmitter gear and the wireless receiver gear constitute elements of a cellular telephone system.

Brief Summary Text (53):

In a more preferred embodiment, each subject motor vehicle is fitted with a GPS receiver unit for receiving location-defining signals from GPS satellites and deriving from the location-defining signals geodetic coordinates for the location at which the signals were received. Suitable GPS receiver units are commercially available which can be mounted in an automobile or similar motor vehicle and connected to a portable computer by means of a GPS unit controller card which plugs into a standard "PC Card" connection slot of the computer. One such GPS receiver unit is commercially available under the trade name "Etak Sky Map" from ETAK, Inc. of Menlo Park, Calif. Another such GPS receiver unit is commercially available under the trade name "Door to Door Co Pilot" from TravRoute Software of Princeton, N.J. Preferred portable computers to which each GPS receiver units can be connected provide a microprocessor, random access memory, read/write mass storage, and input/output facilities including a visual display, keyboard, speaker, and microphone digitizer and can run voice recognition and speech synthesis software.

Detailed Description Text (6):

Turning now to FIG. 2, an automatic driving-activity data collection unit 28 is adapted to be carried on board an automobile or other subject motor-vehicle (not shown). The data collection unit 28 includes a GPS receiver unit 30 connected to a portable computer 32 by means of a receiver connector cable 34 and a GPS unit controller card 35. The GPS receiver unit 30 is mounted in a subject vehicle at a position which provides a line-of-sight radiation-propagation view of the sky essentially unobstructed by metallic or other radiation shielding materials to permit reception of GPS satellite signals. The GPS receiver unit 30 may, for example, be mounted on a dashboard of the vehicle (not shown), on a rear deck of the vehicle beneath a rear window of the vehicle, in a trunk of the vehicle below the rear deck, provided the rear deck is made of cardboard or other substantially radiation-transparent material, or below the trunk lid, provided the trunk lid is made of a plastic composite or other substantially radiation-transparent material.

Detailed Description Text (8):

In operation, the GPS receiver unit 30 receives location definition signals from GPS satellites and, in conjunction with the GPS unit controller card 35, converts the signals into digital location geodetic coordinate data, which defines in terms of latitude and longitude the location of the receiver unit 30 and hence the subject motor vehicle at the time the location definition signals were received. The microprocessor 36 runs a location-data-collection program which causes the microprocessor to transfer location coordinate data at intervals from the GPS unit controller card to the hard drive 40 by way of the peripheral card interface 54 and system bus 46. The location coordinate data are stored as a data sequence encoding successive location coordinates of the subject vehicle in association with data encoding times at which the vehicle was located at the locations specified by the coordinates. To conserve data storage in view of the typically widely varying speeds of a subject motor vehicle, successive location coordinates could differ by an approximately fixed interval of distance; say, 250 meters.

Detailed Description Text (9):

Turning next to FIG. 3, an automatic driving-activity data collection unit 68 is adapted to be carried on board a subject motor vehicle (not shown). Elements essentially common to the automatic driving-activity data collection unit 68 of FIG. 3 and the automatic driving-activity data collection unit 28 of FIG. 2 have identical reference numerals in the Figures. The data collection until 68 includes a GPS receiver unit 30 connected to a portable computer 70 by means of a receiver connector cable 34 and a GPS unit controller card 35. The GPS receiver unit 30 is mounted in the subject motor vehicle at a position which provides a line-of-sight radiation propagation view of the sky to permit reception of GPS satellite signals as described above in connection with the automatic driving-activity data collection unit 28 of FIG. 2.

CLAIMS:

11. The method of obtaining consumer driving-activity market research information according to claim 6 in which the automatic vehicle-location tracking gear on each subject trackable motor vehicle includes a global positioning system ("GPS") satellite receiver for receiving GPS satellite signals for determining location geodetic coordinate data specifying the approximate location of the subject vehicle at the time the satellite signals were received.

12. The method of obtaining consumer driving-activity market research information according to claim 11 in which the data processing system is located in a central station and is in communication with wireless receiver gear,

in which each subject trackable motor vehicle is equipped with wireless transmitter gear connected to the automatic vehicle-location tracking gear, and

in which the step (c) of automatically generating and storing time-annotated vehicle-location data for each subject trackable motor vehicle and each trip portion of the sample group of trip portions includes continually transmitting signals encoding vehicle-location data generated by means of the automatic vehicle-location tracking gear from the wireless transmitter gear on the subject vehicle to the wireless receiver gear and storing time-annotated vehicle-location data for the trip portion in digital data storage of the data processing system.

WEST

L15: Entry 11 of 43

File: USPT

Mar 27, 2001

DOCUMENT-IDENTIFIER: US 6206142 B1

TITLE: Elevator advertising system and method for displaying audio and/or video signalsDATE FILED (1):
19990401Brief Summary Text (6):

A technical problem unaddressed by the conventional construction resides in the inability in such apparatuses to deliver information to passengers of the elevator in an effective manner during travel between floors. Specifically, it would be desirable to display audio/video signals for passengers on an elevator car, whereby useful information, e.g. advertising or marketing information, could be conveyed to the passengers when the passengers are detected. In addition, it would be beneficial to tailor the signal displayed in the car to the location and direction of travel of the passengers in the building.

Detailed Description Text (4):

In accordance with the preferred embodiment of the present invention, the elevator apparatus also broadly includes a signal storage assembly 12, a display 16 for displaying an audio/video signal played back from the storage assembly, a speaker 17 associated with the display, a sensor 18 for detecting a passenger or other obstruction in the doorway of the elevator car, and a sensor 32 for detecting the location of the car in the building. In addition, a third sensor may be provided for detecting the direction of travel of the elevator car, or this condition can be signaled directly by the controller 14 based on the information inputted in the keypad.

WEST

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L15: Entry 10 of 43

File: USPT

Mar 27, 2001

DOCUMENT-IDENTIFIER: US 6208866 B1

TITLE: System and method for location-based marketing to mobile stations within a cellular network

DATE FILED (1):19981230Brief Summary Text (3):

The present invention relates generally to telecommunications systems and methods for transmitting marketing advertisements to mobile stations within a cellular network, and specifically to providing location-based marketing to mobile stations within a cellular network.

Detailed Description Text (11):

It should be understood, however, that any estimate of time, distance, or angle for any cellular system can be used, instead of the TA value method discussed herein. For example, the MS 20 can have a Global Positioning System (GPS) receiver built into it, which can be used to determine the location of the MS 20. In addition, the MS 20 can collect positioning data based on the Observed Time Difference (OTD) between the time a BTS 24 sends out a signal and the time the MS 20 receives the signal. This time difference information can be sent to the MLC 270 for calculation of the location of the MS 20. Alternatively, the MS 20, with knowledge of the location of the BTS 24, can determine its location and forward it to the MLC 60.

WEST

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L15: Entry 7 of 43

File: USPT

Dec 18, 2001

DOCUMENT-IDENTIFIER: US 6332127 B1

TITLE: Systems, methods and computer program products for providing time and location specific advertising via the internetDATE FILED (1):
19990128Abstract Text (1):

Systems, methods and computer program products are provided for selecting an advertising object to be displayed within a Web page requested by a user based on the geographic location of the user and/or on the time of day. Systems, methods and computer program products are provided for validating an offer within an advertising object of a Web page displayed within a Web client in communication with a Web server. Systems, methods and computer program products are also provided for changing content within an object displayed within a Web page based on changes in geographic location of a user. In addition, systems, methods and computer program products are provided for redeeming an electronic coupon stored within a first computing device, wherein the electronic coupon is valid within a designated geographic region and for a designated period of time.

Brief Summary Text (15):

According to one aspect of the present invention, these and other objects are provided by systems, methods and computer program products for selecting an advertising object to be displayed within a Web page requested by a user based on the geographic location of the user and/or on the time of day. A user makes a Web page request via a mobile Web client in communication with a Web server. The mobile Web client, in response to the user request, obtains user location information, for example from a Global Positioning System (GPS), and transmits the user request for the Web page to the Web server with the obtained user location information. The Web server selects an advertising object based upon the user's location and/or the time of day the Web page request is received. The Web server generates the requested Web page with the selected advertising object included therein and serves the generated Web page to the mobile Web client. Advertising objects can include text files, audio files, video files, image files, hyperlinks, and the like.

Brief Summary Text (16):

According to another aspect of the present invention, systems, methods and computer program products are provided for validating an offer within a Web page advertising object displayed within a Web client in communication with a Web server. An advertising object contains a validation anchor that references a remotely located validation program. Furthermore, the validation anchor is associated with an indication of time. In response to user selection of the validation anchor for the purpose of validating the offer within the advertising object, the Web client retrieves user location information, for example from a GPS. The Web client then transmits the validation request to the Web server with the retrieved user location information and/or with time of day information. The Web server determines the validity of the offer based on the received user location information and/or the received time of day information. The Web server then communicates the validity of the offer to the user.

Drawing Description Text (4):

FIG. 3 illustrates operations for selecting an advertising object to be displayed within a Web page requested by a user according to an embodiment of the present

invention.

Drawing Description Text (6):

FIG. 5 illustrates operations for validating an offer within an advertising object displayed within a Web page according to an embodiment of the present invention.

Detailed Description Text (8):

An advertising object 32 is contained within the generated Web page 26, as illustrated. According to an embodiment of the present invention, a lookup table 27 is utilized to associate time of day and user locations with a plurality of respective advertising objects stored within the database 30. Accordingly, as will be described below, an advertising object can be selected for display within a requested Web page based on a user location and/or on the time of day. Exemplary advertising objects may include text files, audio files, video files, image files, and the like.

Detailed Description Text (18):

Referring now to FIG. 3, operations for selecting an advertising object to be displayed within a Web page requested by a user according to the present invention are illustrated. In response to a user's request for a Web page via a mobile Web client in communication with a Web server, the mobile Web client retrieves information about the user's current location (Block 100). User location information may be obtained via a GPS (22, FIG. 2) in communication with the mobile Web client (21, FIG. 2). A GPS is a constellation of spaced-apart satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. A GPS is well understood by those skilled in the art and need not be described further herein.

Detailed Description Text (23):

As an example of this aspect of the present invention, a user requests a Web page from a Web server via a mobile Web client. The Web server utilizes user location information transmitted with the Web page request to select an advertisement object that presents information about something that is physically near the user's present location. For example, information relating to the nearest store in a national chain of stores can be presented within an advertising object displayed within a Web page.

Detailed Description Text (24):

As another example of this aspect of the present invention, an advertisement object(s) can be selected based on the time of day a user request is received by a Web server. For example, an advertisement object related to bagels may be selected and displayed within a requested Web page when the Web page request is received between the hours of 6:00 o'clock in the morning and 9:00 o'clock in the morning. By contrast, an advertisement object related to a tavern's "happy hour" may be selected and displayed within the requested Web page when a user request is received between the hours of 6:00 o'clock in the evening and 8:00 o'clock in the evening.

Detailed Description Text (28):

Referring now to FIG. 5, operations for validating an offer within an advertising object displayed within a Web page on a mobile Web client, according to the present invention, are illustrated. The displayed Web page contains an advertising object having a validation anchor as described above. A user selects the validation anchor to validate an offer made within the advertising object (Block 200). In response to the user's selection of the validation anchor, the mobile Web client retrieves information about the user's current location (Block 202). User location information may be obtained via a GPS in communication with the mobile Web client. However, as discussed above, the present invention is not limited to the use of a GPS for retrieving user location information.

Detailed Description Text (30):

As an example of this aspect of the present invention, an advertising object for a particular commercial enterprise displayed within a Web page may contain an offer that reads: "If you buy product "X" within the next ten minutes, there will be a 10% discount." When the Web server receives the user's validation request, time of day information encoded within the validation anchor can be decoded to determine whether the user has made the request within the ten minute window.

Detailed Description Text (35):

Alternatively, the JAVA.RTM. applet 40 may contain a plurality of advertising objects within a lookup table 27, wherein each advertising object is associated with a GPS region and/or time of day. When the user moves with the mobile Web client 21 out of a region associated with a particular advertising object, the JAVA.RTM. applet 40 replaces the displayed advertising object with a different advertising object. Similarly, if a window of time within which a particular advertising object is to be displayed expires, the JAVA.RTM. applet 40 replaces the displayed advertising object with a different advertising object.

Detailed Description Text (36):

As illustrated in FIG. 6, an advertising object with content "A" is displayed if the user is within the GPS region "North Carolina" and the time of day is the evening. Content "B" is displayed within the advertising object if the user is within the GPS region "Virginia" and the time of day is the morning.

Detailed Description Text (38):

For example, a Web page displayed within a mobile Web client includes an advertising object with content related to one of a national chain of restaurants nearest to the user. As the user moves, the JAVA.RTM. applet (40, FIG. 6) monitors the user's location. When the user moves out of a particular GPS region associated with the displayed advertising object, the JAVA.RTM. applet refreshes itself to reflect the restaurant in the national chain that is now within the user's present GPS region. The JAVA.RTM. applet may be refreshed either by making an HTTP request to a Web server or by loading a new advertising object into the displayed Web page from local cache included within the JAVA.RTM. applet within the Web client.

WEST

 Generate Collection

L12: Entry 7 of 30

File: USPT

Oct 23, 2001

DOCUMENT-IDENTIFIER: US 6307958 B1

TITLE: Method and system for building a database for use with selective incentive marketing in response to customer shopping histories

DATE FILED (1):19970718Abstract Text (1):

A system and method is disclosed for retail store marketing. A memory stores a database of existing customers of the retail store. The database includes a unique customer identification code for each customer. A memory stores a list of unique identification codes for prospective customers of the store who reside in a predetermined geographical area relative to the store. Circuitry compares the unique identification codes in the stored database of existing customers with the stored list of unique identification codes of prospective customers. Circuitry eliminates data from the list of prospective customers relating to the store's existing customers, such that a non-customer database is produced for use in marketing.

Brief Summary Text (4):

Retail and other business establishments that serve a large number of customers generally have a problem obtaining transactional information about their customers, such as for identifying new customers and determining transactional patterns for repeat customers (such as transactional frequency and dollar volume).

Brief Summary Text (8):

Thus, check verification presents a store with problems in customer relations and risk management. A store naturally seeks to improve customer relations with the great majority of customers who do not present check transaction problems by efficiently and quickly authorizing check transactions. However, the store must guard against the financial risks from customers who do write bad checks, either as part of a concerted bad check scheme or as a result of less larcenous conduct that may range from simple bookkeeping mistakes to overly aggressive check floating. In the former case, bad check risk is greatly dependent upon abnormal check transaction activity over a given interval. In the latter cases, the bad check risk is greatly dependent upon check transaction history (total check transaction frequency and dollar volume at a store).

Brief Summary Text (12):

Beyond these check verification and risk management problems, grocery stores have a broader problem in accumulating customer information because of the emphasis on minimizing the amount of time required for a sales transaction, and the attendant impersonality of the customer relationship. Thus, it is extremely difficult to develop any meaningful customer profiles, or to identify customer groups such as regular customers and new customers who might become regular customers. If a store could accumulate more detailed customer information, customer profiles could be developed and used for targeted advertising, marketing and promotional programs.

Brief Summary Text (13):

Accordingly, a need exists for a transaction processing system for individual stores (in both single and multiple store environments) that facilitates check transactions by improving the efficiency of the check verification process, and that maintains a local customer database containing transactional information about the store's customers useful for check verification risk management, and for other customer relations purposes such as identifying new customers and profiling regular customers.

Brief Summary Text (14):

Prior credit verification systems require connecting a point-of-sale terminal through telephone lines to a remote transaction processing system, thereby increasing not only the cost of operating the systems, but also increasing the time for providing check verification. Also, existing systems typically do not focus on maintaining a local customer database useful not only for check transaction processing, but also for identifying new customers and developing customer profiles for regular customers.

Brief Summary Text (16):

Copending patent application Ser. No. 07/826,255 discloses a system and technique wherein a customer's checking account number may be used as a unique customer identification number to provide credit verification and also to perform marketing functions. In such a prior system, such customer checking account numbers have been manually entered by the retail store clerk, thus causing delay and possible inaccuracies. A need has thus arisen for an automated system for providing quick and efficient check verification and marketing follow-up. Previous automatic readers have, however, not been satisfactory for such purposes, because of their inability to uniformly detect desired account information on all checks in a consistent manner. Readers should also be able to read credit cards as well as checks.

Brief Summary Text (19):

Important aspects of the present invention are to facilitate check transactions by reducing the requirements for customer identification, to enable a store to adopt a risk management approach to check verification based on a customer's transactional history (frequency and dollar volume over specified intervals), and to improve a store's marketing and other customer relations programs by collecting transactional data for that store, both current and historical, that can be used to identify new or infrequent customers, develop customer profiles and to perform targeted marketing.

Brief Summary Text (20):

More specifically, this invention is a check transaction processing system that uses a customer's checking account number as a unique customer identification number. Thus, the system does not require time-consuming checking of additional customer identification, but only requires the speedy entry of the customer's checking account number by use of an improved automatic check reader in accordance with the present invention. The system operates at an individual store, and maintains at that store a local customer database of customer records, each identified by the corresponding customer check identification number. The customer records also include customer information, such as check verification data (such as verification status) as well as other selected transactional data (such as transaction frequency and dollar volume), the verification and transaction data being regularly updated with new data (such as during check transaction verification).

Brief Summary Text (21):

The system includes one or more transaction terminals, coupled to a transaction processor that stores the customer database. A transaction terminal is used to transmit a customer information request (such as for check transaction verification), which includes an automatically read customer's check identification number, from the point of sale (POS) to the transaction processor.

Brief Summary Text (22):

The transaction processor processes the customer information request, using the check identification number to search the customer database and retrieve the corresponding customer record, if any. Based on the customer information in the customer record, or the lack of a customer record, the transaction processor returns an appropriate response (such as check verification status) and marketing response information to the transaction terminal.

Brief Summary Text (23):

Thus, the method of this invention for check transaction processing involves various aspects of: (a) identifying a customer by automatically reading the customer's unique check ID; (b) developing and maintaining for a store a local customer database of customer records, each identified by the corresponding customer check identification number, and each including customer information (such as verification status and

transactional data); (c) generating a customer information request; (d) processing the request using the customer check identification number to access the corresponding customer record, if any; (e) returning an appropriate customer information response based on the customer information in the customer record; (f) updating the customer database regularly to reflect new customer information; and (g) utilizing the database to perform targeted marketing functions.

Brief Summary Text (28) :

Moreover, because the check transactional data is generated and maintained locally, it provides significant information about the store's customers over and above the information necessary for check verification risk management. New customers are readily identified, and frequency and dollar volume information may be used to establish customer profiles and to target advertising, marketing and promotional programs, and for other customer relations purposes.

Brief Summary Text (31) :

Important features and advantages of this invention are the following. The check transaction processing system uses the automatic reading of the customer's check identification number, which is used as a unique customer identification number, thus avoiding the requirement for additional identification and the attendant delay in completing the check transaction.

Brief Summary Text (33) :

For check verification, the system uses three primary status levels--POSITIVE, NEGATIVE and CAUTION--allowing the store to identify those customers with a bad check outstanding, and to identify new customers and establish selected interim risk management procedures for granting those customers check transaction privileges. In addition to check verification status, the system collects and accumulates selected additional transactional data, including frequency and dollar amounts over specified intervals (such as Day/Week/Month/Quarter/Total) and other historical information such as departments shopped, products purchased and the like, thus allowing the store to adopt risk management approach to check verification tailored to the store's particular customer and financial situation by conditioning check authorization on meeting certain selected transactional limits regardless of customer status (the CALL MANAGER response), and allowing the store to develop customer profiles and to target advertising, marketing and promotions, and otherwise improve customer relations.

Brief Summary Text (35) :

The check transaction processing system is implemented by a multi-tasking program, and uses local area network data communication among the transaction terminals and the transaction processor, allowing efficient operation of the system at each individual store. The present system can also use credit cards, and the like, as well as checks to provide customer identification information in building a database on customer transactions. Additionally, the present system can receive a customer's identification directly from a terminal or other input device.

Detailed Description Text (4) :

A customer's bank checking account number provides a unique identification for that customer--using this check ID, a customer record is created and included in the local customer database. The customer record includes an assigned customer verification status, as well as selected transactional data. Customer status designations include POSITIVE, NEGATIVE and CAUTION, while transactional data includes transaction frequency and dollar volume over given intervals (such as Day/Week/Total or DWT). Selected transactional (CALL MANAGER) limits are assigned to both CAUTION and POSITIVE status. This customer information (customer status and transactional data) in the customer database is continuously updated (a) on a local basis through either processing check verification requests, or inputting customer status, and (b) in the case of a multiple store business, on a global basis through inter-store transfers of selected customer information (such as CAUTION and NEGATIVE status information).

Detailed Description Text (40) :

The check transaction processing system is located at a store, and maintains a local customer database for that store. For a multiple store business, a local system is located at each store and global customer information transfers are used to supplement the essentially local customer database.

Detailed Description Text (52) :

For example, to initiate a check verification request, check reader 121 automatically scans the magnetic ink character recognition (MICR) data printed along the bottom edge of the customer's check and then the store clerk operates the keypad 122 to enter the amount of the check, along with the function code designating check verification. This request is displayed on display 124, and sent, along with data from the check reader 119, to transaction processor 112. The check verification response, including the customer's verification status (such as POSITIVE, NEGATIVE or CAUTION), and marketing information (such as the type of coupon to be dispensed) returned by the transaction processor is then displayed on display 124.

Detailed Description Text (54) :

The MICR encoding of checks is known, and a detailed explanation of the MICR encoding scheme may be found in The MICR Handbook by Rylla R. Goldberg, published by Heath Printers, the subject matter which is hereby incorporated by reference. As noted in The MICR Handbook, and as will be subsequently described, the field of the MICR symbology located on the bottom of the check is broken into various data fields in which different banks can place different data at different locations. Conventional automatic check readers such as those noted in the above-noted patents often cannot detect a customer's checking account number because it is interspersed with other data such as the check sequence number.

Detailed Description Text (55) :

The present automatic check reader is provided with structure which enables the customer checking account number and the bank transit number (which identifies the bank) to be detected within the code printed on the customer's check. This process involves detecting or parsing (the examination or analysis of a string of numbers or characters which is designed to detect or identify various subgroupings or sets within the string) followed by extraction of that set or sets which have been defined as the customer checking account number. The present automatic check reader is thus provided with circuitry which enables the customer's checking account number and the bank transit number to be parsed or detected and the remainder of the data extracted or omitted, such that the customer's checking account number and the bank transit number may be used as the unique customer identification code for the present invention. The present check reader thus provides substantial advantages over prior check readers which have not been useful for check verification or marketing techniques because it was not possible for such prior check readers to consistently detect customer account numbers on checks presented from different banks and bank branches.

Detailed Description Text (68) :

The important aspect of the invention is the ability to always recognize a customer's checking account number in a MICR line automatically, no matter which bank or which type of account is involved. With the ability to generate an extremely accurate indication of the customer's account number and the bank transit number, a unique customer identification code is provided which may be utilized to provide the many advantages of the invention to be subsequently described.

Detailed Description Text (69) :

While the preferred customer identification code comprises the checking account number and the bank transit number, it should be understood that various aspects of the invention may be practical using different customer identification codes. For example, many of the marketing and verification techniques hereinafter described can be accomplished by the store clerk manually entering the name, address and/or phone number into the system through data terminal keypad 122. This unique identifying data could then be used to identify the store customer. While such manual entry is slower and not as efficient or accurate as the automatic reading of the MICR code, the manual technique may have applications in certain circumstances.

Detailed Description Text (127) :

Customer status is assigned during customer record creation, and then updated (transactionally, locally or globally) to reflect changes in customer status, such as due to elapsed time between check transactions or bad check history.

Detailed Description Text (138) :

The specific design of the customer database, and in particular the file specifications for the customer file, negative status file, and system control file, are not critical to the invention, being a matter of design choice. Any customer database will likely comprise customer records identified by the customer check ID, and include selected transactional/customer information; such as check verification status and transactional frequency and dollar volume over specified intervals.

Detailed Description Text (144):

It can thus be seen that the check reader 119, in combination with the MICR parsing subroutine of FIGS. 4A-1 through 4A-3 operates to detect and extract the customer's account number on all checks, regardless of where located or even if improperly identified by a space or symbol. By teaching the processor any changes in the bank transit number or any unique positioning of the account number, the system thus is always able to promptly identify and detect a customer's unique ID for further use.

Detailed Description Text (196):

2.11. Customer Information Reporting. The check transaction processing system allows a store to build and maintain a customer database containing customer information useful for identifying new customers and developing customer profiles, in addition to its use for check verification.

Detailed Description Text (198):

Customer information reports are recommended (a) to identify new customers, and (b) to develop customer profiles, both of which can be used in targeting marketing, advertising and promotional programs, and for other customer relations purposes. Specifically, new customers are identified by regularly reporting customer records with a CAUTION status. Regular customers are identified by reporting customer records based on DWT Frequency data, while the level of a customer's business is identified by reporting customer records based on DWT \$Amount data. Additional customer information that can be readily collected in the customer records includes zip code and marital status information useful in demographic analysis.

Detailed Description Text (426):

After the activity for sending customer records (by selected status) has executed, the next activity specified in the Event Table is for sending negative status records (both NEGATIVE and CASH ONLY status). The corresponding routine in the event subtask for executing the send negative status record activity operates identically to the send customer record routine (850) in retrieving negative status records accessed during the current global update event interval from the negative status file and sending those records to the host.

Detailed Description Text (456):

The present invention provides a method which may be accomplished utilizing the automatic check reader 119 in order to automatically build a database for use in a retail store marketing program. With use with the system, a customer's check is quickly scanned by the check reader 119 of the invention at the point of sale, or at another suitable location within the store. Due to the unique nature of the reader 119, all checks from all banks can be read and the customer identification number can be detected in any MICR location. Moreover, changes in bank transit codes and other identification changes can be automatically detected by the system so that the customer may be tracked, as previously described. The detected unique customer identification code is then transmitted to the host computer 110 which stores a previously stored database of unique customer identification codes. The detected unique customer identification code is then compared against the stored database. The system detects the occurrence of a match between information in the stored database and the detected unique customer identification code. When a match occurs, a determination is made if all necessary predetermined identification criteria related to the detected unique customer identification is in the stored database. Specifically, a determination is made if the full address and the telephone number of the detected identification code was previously stored in the database.

Detailed Description Text (457):

If the predetermined customer identification data is found in the stored database, a signal is transmitted from the host processor 110 to the POS terminal 120 to provide a display that the customer record is complete and that no further data is required, or

in the alternative a signal may be transmitted in only those instances when additional information is required to complete the database criteria. If an indication is provided that the predetermined identification criteria is not contained in the database, such as lack of address information or the like, a signal is generated to the POS terminal 120 to indicate that insufficient identification criteria exists. The store personnel may then input the required additional identification criteria into the database. The additional identification criteria is then entered into the database of the host processor 110 for storage in conjunction with the unique customer identification code. This entering of additional identification criteria will normally be done "after hours" by setting aside the check in question and entering the data in a "back room" in the store. The system also generates information about the date and amount of the transaction, which is also stored in the database.

Detailed Description Text (461):

FIGS. 14A and 14B illustrate a software program subroutine operable to be performed in the host processor 110 in order to purge existing customers from a database. In operation, the system of the present invention is utilized so such that the check reader 119 automatically scans a customer's check and inputs the customer's unique identification number based upon the customer's checking account number into the system. The specific steps of the routine of FIGS. 14A and 14B are described in detail as follows:

Detailed Description Text (462):

In summary, it may be seen that the technique of FIGS. 14A and 14B provides a method for retail store marketing which begins with the stored database of existing customers of the retail store which has been accumulated in the manner previously described. The database includes each customer's checking account identification number for use as a unique customer identification code, along with additional customer identification data such as home address, telephone number and the like. Each time a retail customer enters the retail store and makes a purchase, the unique customer identification code of the customer is detected by the present system. Comparison is made of each entered unique customer identification code with the stored database. A list of prospective customers of the retail store in a predetermined geographical area is obtained through conventional sources and is stored in the host processor 110. Comparison is made of the stored database with the list of prospective customers. All data is eliminated from the list of prospective customers which relates to information contained in the stored database, such that a non-customer database is produced which contains data relating only to prospective customers who do not appear on the stored database.

Detailed Description Text (469):

FIGS. 15A and 15B illustrate a marketing program which uses the system of the present invention to detect infrequent customers such that marketing may be directed at those infrequent customers. Specifically, the techniques shown in FIGS. 15A and 15B identify customers who have not shopped since a predefined target date, such as thirty days. After developing this list of infrequent shoppers, the store can then mail out direct mail enticements to the customer, such as providing them with coupons and the like if they shop at that particular store.

Detailed Description Text (471):

It may thus be seen that the program of FIGS. 15A and 15B provides an efficient technique of building a customer database and mailing list using checks from a variety of different banks. In operation, a customer's checking account identification number is detected by the check reader 119 for use as a unique customer identification code. As previously disclosed, a unique aspect of this invention is that the present check reader can determine checking account identification numbers even if the proper spacing and symbology is not utilized. The system can also detect changes in bank transit numbers. The checking account identification number is entered into processor 110 which contain a database that maintains customer records including the customer's name and address, the checking account identification number, and customer shopping habits and transactional data over a preselected time interval. The checking account identification number is compared with the database. A response is generated by the processor 110 to signal the presence of the customer's checking account identification number or the failure to locate the customer's checking account identification number. A new record is then created in the database for that customer's checking account identification number in response to a processor 110 response indicating the failure

to locate, so that the customer's name and address is entered into the record along with a shopping incidence and shopping data being recorded in the database concurrently. A list of customers is then generated in the database whose last transaction date is prior to a preselected interval of inactivity so that grouping or subgrouping of customers is available for marketing efforts.

Detailed Description Text (476):

In accordance with the techniques shown in FIGS. 16A and 16B, a customer's checking account identification number is entered as a unique customer identification code by the check reader 119. Host processor 110 is programmed to store a database which includes a plurality of unique customer identification codes and check cashing history of prior customers of the retail establishment, including date of check transactions. The processor then compares each newly entered unique customer identification code against the stored database. A signal is generated to indicate the presence of a complete customer information record or of an incomplete customer information record as a result of the comparison. A second database is then generated which lists customers whose last unique customer identification code entry date falls within a preselected date range. A promotion may then be selectively offered by the retail establishment to customers within the second database. For example, coupons or other enticements may be mailed directly to the customers on the second database, or distributed at the POS.

Detailed Description Text (481):

Many of the prior art marketing techniques require the mailing of coupons to customers after the targeted database has been developed. With the techniques shown in FIGS. 17A and 17B, coupon rewards and other incentives may be made at the time of the point of sale. The invention contemplates at least three different ways of accomplishing a coupon reward at the point of sale. One is to utilize display 124 (FIG. 2A) which displays information to the store employee to indicate what type of coupon or other incentive reward is to be dispensed, and the employee hands the coupons to the customer, or in the alternative the clerk/operator may mark or set aside the check for use as a source of a mailing list for distribution of incentives. As an example, as previously noted, let us assume that three coupon packs A, B and C have been developed, based upon the desire to provide different incentive rewards for a secondary shopper, a primary shopper and high volume shopper. Three stacks of 0 these coupon packs are placed readily available to the store employee. When a shopper comes in and presents a check, the check is scanned through the check reader 119 and the host processor 110 utilizes the technique of FIGS. 16A and 16B to generate an indication of whether or not the shopper is a secondary, primary or high volume shopper. The display 124 then generates a display that says "This shopper is a primary shopper. Please give this shopper coupon pack B." The store employee would then hand the customer a coupon pack B. As other customers come through that are different types of shoppers, different coupons are provided to them. In this way, the present invention enables the store to discriminate between various types of customers in order to induce the infrequent shopper to come back, while maintaining the goodwill of good shoppers

Detailed Description Text (482):

A third technique of distributing coupons utilizes a system to actually print, at the point of sale, coupons bearing the desired information based upon selected criteria. Commercially available printers may be used for generating coupons at a point of sale, such as disclosed in U.S. Pat. No. 4,723,212 issued on Feb. 2, 1988 and entitled Method and Apparatus for Dispensing Discount Coupons or as further disclosed in U.S. Pat. No. 4,910,672 issued Mar. 20, 1990 and entitled Method and Apparatus for Dispensing Discount Coupons. As disclosed in the two aforesaid patents, systems may be provided to generate coupons at the point of sale based upon the type of product purchase. In the disclosures of the above-captioned two patents, a coupon relating to a particular type of a product is generated based upon a bar code reader determining that a triggering or competing product has just been purchased by the consumer. The same coupon dispensing apparatus described in the two aforesaid patents may be utilized to print the coupons as described in FIGS. 16A and 16B, but based upon the criteria and the operation of the present invention.

Detailed Description Text (485):

FIGS. 18A, 18B, and 18C illustrate a technique for generating coupons based upon the

particular transaction currently being accomplished by the customer. The technique of FIGS. 18A, 18B, and 18C detects the particular store departments in which the products being purchased are located. This system requires the use of the bar code scanner to detect which products are being purchased, and which departments are being shopped by the customer. For example, the technique shown in FIGS. 18A, 18B, and 18C detects whether or not items have been purchased from the meat department, dairy department or deli. Based upon data stored within the computer, the decision is then made as to whether to award a coupon and what type of coupon to award. For example, if the data illustrates that over a period of time a shopper shows a consistent failure to shop at the delicatessen, then when the customer's check identification is scanned into the check reader 119, the processor 110 pulls up the customer's history and generates a coupon to induce the customer to shop at the delicatessen the next time the customer shops. This inducing can be done by providing the customer with a very high value coupon used only for deli shopping.

Detailed Description Text (486):

Similarly, the stored data in processor 110 may contain information regarding particular product groups. If it is determined that the customer is a frequent shopper but does not purchase coffee, the data may determine that a coupon providing a large discount on coffee would be suitable to give to the customer. Alternatively, the system might determine that the customer had no history of buying a specific brand of coffee, and incentive coupons can be distributed for that brand of coffee. To provide this information, information regarding the particular product and the department of the product is generated by the bar code reader 123a, or through entry through the cash register, and transmitted to the host processor 110. The host processor 110 then identifies each particular product being purchased, compares it against the stored data tables and generates an indication of the type of coupon to be given to the customer. As previously noted, this indication from the host processor 110 may comprise a signal transmitted on the display 124 or the signal may be utilized to generate the actual printing of a coupon using the system similar to that shown in U.S. Pat. Nos. 4,723,212 and 4,910,672.

Detailed Description Text (487):

The present invention differs from the systems disclosed in the above-identified patents because, among other things, the present system generates coupons based upon the lack of purchase of a particular item by comparing against stored history for unique customer IDs, rather than because of the purchase of a particular item.

Detailed Description Paragraph Table (21):

Step Description 3 Beginning of process being flowed. 5 Check is taken for tendering purchase at retail store. 6 Once the bank's transit number and customer's checking account number are parsed from the MICR band, they are combined (transit number followed by account number) to form the customer's unique checking account ID. This ID is used as a primary key for a customer database on disk indexed by checking account ID. 10 If no records exists, one is created for this checking account ID and the operator is signaled the record is incomplete of predetermined identification criteria. 13 If a record exists in the database for the customer with this checking account ID, the completeness of predetermined identification criteria is checked and the result is signaled back to the operator. Shopping event and dollars spent are recorded in order to build a shopping history for each customer's record. 14-15 The store has on hand coupons to be handed out at the point of sale. These coupons may be arranged into varying value packages. We will assume 3 different coupon packs for point-of-sale disbursement: Coupon VALUE A: For customer who has been determined to be a SECONDARY shopper. This would be incentive to make them become a PRIMARY shopper. Coupon VALUE B: For customer who has been determined to be a PRIMARY shopper. This would be a lesser incentive package to primarily maintain a consistency whereby everyone receives a package. Coupon VALUE C: For customer who has been determined to be a HIGH VOLUME shopper. This incentive would be used as a means to hold on to especially good shoppers. 17 There are two methods for determining the coupon package to be dispersed at the point of sale. Steps 18-21 deal with preselected criteria analyzed OFF-LINE and downloaded to the front end computer. Steps 23-34 deal with ON-LINE determination based on prior 30 days shopping VS two preselected dollar LIMITS (LIMIT 1 and LIMIT 2). 18 OFF-LINE ANALYSIS: 19 Preselected criteria such as shopping volume, frequency, demographics, etc. along with how they relate to the Coupon offerings are set for OFF-LINE analysis. 20 Each record is analyzed against said

preselected criteria and corresponding Coupon VALUEs are selected and flagged. Said Coupon VALUE information is then downloaded to the ON-LINE processor. 21 On the customer's next visit, ON-LINE processor uses said downloaded Coupon VALUE information to flag to clerk which point-of-sale Coupon VALUE package to disperse to the customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 23 ON LINE 30 DAY ANALYSIS: 24 Two dollar limits are preselected, ie: LIMIT 1 = 100.00 LIMIT 2 = 350.00 25 Prior dollars spent for the previous 30 days are calculated and compared with said preselected dollar limits. 26-27 If prior dollars spent for previous 30 days is LESS THAN LIMIT 1, customer is considered a SECONDARY shopper; Coupon VALUE A is dispersed to customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 30-31 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 1, but LESS THAN LIMIT 2, customer is considered a PRIMARY shopper; Coupon VALUE B is dispersed to customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 34 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 2, customer is considered a HIGH VOLUME shopper; Coupon VALUE C is dispersed to customer. 40-46 Coupons are dispersed either with clerk manually handing indicated packet to customer or by ON-LINE processor spooling selected Coupon VALUE to a point-of-sale coupon printer, or by having the clerk mark the check with a code so that coupons may be subsequently distributed to the customer by direct mail.

Detailed Description Paragraph Table (22):

Step Description 3 Beginning of process being flowed. 5-9 Customer's purchase is transacted using bar code scanning cash register. As each item is scanned, said cash register maintains a record of preselected criteria for each item such as product, product group, department, etc. for the customer's purchase. 10 Check is taken for tendering purchase at retail store. 15-16 Once the bank's transit number and customer's checking account number are parsed from the MICR band, they are combined (transit number followed by account number) to form the customer's unique checking account ID. This ID is used as the primary key for a customer database on disk indexed by checking account ID. 19 If no record exists, one is created for this checking account ID and the operator is signaled the record is incomplete of predetermined identification criteria. 22 Send scanned data of said preselected criteria to the ON-LINE front end processor. 23 If a record exists in the database for the customer with this checking account ID, the completeness of predetermined identification criteria is checked and the result is signaled back to the operator. Shopping event and dollars spent are recorded in order to build a shopping history for each customer's record. 24 Processor updates customer's record with the said scanned information of preselected criteria. 26-27 The store has on hand coupons to be handed out at the point of sale. These coupons may be arranged into varying packages. We will assume 3 different coupon packs for point-of- sale dispersement: Coupon VALUE A: For customer who has been determined to be a SECONDARY shopper. This would be incentive to make them become a PRIMARY shopper. Coupon VALUE B: For customer who has been determined to be a PRIMARY shopper. This would be a lesser incentive package to primarily maintain a consistency whereby everyone receives a package. Coupon VALUE C: For customer who has been determined to be a HIGH VOLUME shopper. This incentive would be used as a means to hold on to especially good shoppers. 29 There are two methods for determining the coupon package to be dispersed at the point of sale. Steps 30-33 deals with preselected criteria analyzed OFF-LINE and downloaded to the front end computer. Steps 35-46 deals with ON-LINE determination based on prior 30 days shopping VS two preselected dollar LIMITS (LIMIT 1 and LIMIT 2). 30 OFF-LINE ANALYSIS: 31 Preselected criteria such as shopping volume, frequency, demographics, etc. along with how they relate to the Coupon offerings are set for OFF-LINE analysis. 32 Each record is analyzed against said preselected criteria and corresponding Coupon VALUES are selected and flagged. Said Coupon VALUE information is then downloaded to the ON-LINE processor. 33 On the customer's next visit, ON-LINE processor uses said downloaded Coupon VALUE information to flag to clerk which point-of-sale Coupon VALUE package to disperse to the customer. Proceed to step 61 for METHOD OF DISPERSEMENT. 35 ON-LINE 30 DAY ANALYSIS: 36 Two dollar limits are preselected, ie: LIMIT 1 = 100.00 LIMIT 2 = 350.00 37 Prior dollars spent for the previous 30 days are calculated and compared with said preselected dollar limits. 38-39 If prior dollars spent for previous 30 days is LESS THAN LIMIT 1, customer is considered a SECONDARY shopper; Coupon VALUE A is dispersed to customer. Proceed to step 51 to determine WHICH coupons to disperse. 42-43 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 1, but LESS THAN LIMIT 2, customer is considered a PRIMARY shopper; Coupon VALUE B is dispersed to customer. Proceed to step 51 to determine WHICH coupons to disperse. 46 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 2, customer is considered a

HIGH VOLUME shopper; Coupon VALUE C is dispersed to customer. 51-52 Customer's database record contains fields to monitor preselected shopping activities such as purchase of particular products, product groups, departments, etc. 54 Processor has determined what VALUE of coupons to be dispersed, now said database fields monitoring preselected shopping activities are used to determine which coupons in particular to disperse based upon exception to previous shopping activity. 55 MAX-SUB represents the number of said preselected items (products, product groups, departments, etc.) being maintained and monitored for shopping activity. 56 TABLES represent a table of coupons that represent incentives for each said preselected item (products, product groups, departments, etc.). TABLES are arranged in order of decreasing priority. 61-70 Step through each said-preselected item in decreasing priority and check for an exception in shopping activity. If the customer has not shopped this preselected item, this particular Coupon is chosen for dispersement. This process continues through said preselected items until the total value of Coupons chosen for dispersement meets or exceeds said VALUE as determined in steps 29-46. 74-78 If after stepping through said preselected items and the value of dispersement does not meet or exceed said VALUE as determined in steps 29- 46, an alternate table of general incentive coupons in order of decreasing priority is stepped through until said VALUE is met or exceeded. 83-88 Coupons are dispersed either with ON- LINE processor spooling selected Coupons to a point-of-sale coupon printer or via Direct Mail.

CLAIMS:

1. A system for generating an incentive signal for an individual customer at the point-of-sale in a retail establishment comprising:

a first apparatus for receiving unique customer identification codes from a plurality of customers at the point-of-sale in retail transactions;

a second apparatus for detecting universal product codes associated with products purchased by the plurality of customers;

a processor coupled to the first apparatus and to the second apparatus for creating a database containing product information for the plurality of customers relating to the universal product codes of products previously purchased by the plurality of customers, the product information stored in association with the unique customer identification codes for the plurality of customers; and

circuitry coupled to the processor and to the database for generating an incentive signal at the point-of-sale during the individual customer's retail transaction, in response to receiving the unique identification code of the individual customer, if the product information relating to previously purchased products for the individual customer satisfies a predetermined criteria.

3. The system of claim 1 wherein the apparatus for dispensing comprises a printer.

6. The system of claim 1, wherein the product information for the individual customer represents a product purchasing history for the individual customer over a selected time period.

7. A system for generating an incentive signal for an individual customer at the point-of-sale in a retail establishment comprising:

a terminal for entering a customer identification code for the individual customer during a retail transaction;

a bar code reader for detecting universal product codes associated with products purchased by the individual customer in shopping visits;

a processor and memory coupled to the terminal for storing a plurality of universal product codes detected in a plurality of prior shopping visits for a plurality of customers, the universal product codes for the individual customer being stored in association with the customer identification code of the individual customer and representing a prior product purchasing history for the individual customer; and

circuitry operable to access the memory in response to the entering of the customer identification code for the individual customer during the retail transaction, the circuitry further operable to generate the incentive signal at the point-of-sale according to the prior product purchasing history for the individual customer.

9. The system of claim 7 wherein the apparatus for dispensing comprises a printer.

11. A method of generating an incentive signal for an individual customer at the point-of-sale in a retail establishment comprising:

receiving unique customer identification codes from a plurality of customers at the point-of-sale in retail transactions;

detecting universal product codes associated with products purchased by the plurality of customers;

creating a database containing product information relating to the universal product codes of products previously purchased by the plurality of customers, the product information stored in association with the unique customer identification codes for the plurality of customers;

receiving the unique identification code of the individual customer; and

generating an incentive signal at the point-of-sale during the individual customer's retail transaction if the product information from prior retail transactions for the individual customer satisfies a predetermined criteria.

13. The method of claim 11 and further comprising the step of entering the unique customer identification code of the individual customer using a reader.

15. The method of claim 11, wherein the product information for the individual customer represents a product purchasing history for the individual customer over a selected time period.

16. A method of generating an incentive signal for an individual customer at the point-of-sale in a retail establishment comprising:

entering customer identification codes for a plurality of customers during retail transactions;

detecting universal product codes associated with products purchased by the plurality of customers in prior shopping visits;

storing the universal product codes detected in prior shopping visits for the plurality of customers, the universal product codes for the individual customer being stored in association with the customer identification code of the individual customer and representing a prior product purchasing history for the individual customer;

entering the customer identification code for the individual customer; and

generating the incentive signal at the point-of-sale according to the prior product purchasing history for the individual customer.

18. The method of claim 16 and further comprising the step of entering the unique customer identification code of the individual customer using a reader.

20. The method of claim 16, wherein the prior product purchasing history for the individual customer is limited to a selected time period.

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L12: Entry 3 of 30

File: USPT

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DOCUMENT-IDENTIFIER: US 6424949 B1

TITLE: Method and system for selective incentive point-of-sale marketing in response to customer shopping histories

DATE FILED (1):19970312Abstract Text (1):

A system and method is disclosed for customer promotion. A terminal enters a customer's identification code, along with customer transaction data, at the point-of-sale. A memory stores a database of previously entered customer identification codes and transactions data. Circuitry is provided for generating a signal representative of a customer's shopping history, wherein incentive coupons may be issued to customers in dependence upon the signal.

Brief Summary Text (4):

Retail and other business establishments that serve a large number of customers generally have a problem obtaining transactional information about their customers, such as for identifying new customers and determining transactional patterns for repeat customers (such as transactional frequency and dollar volume).

Brief Summary Text (8):

Thus, check verification presents a store with problems in customer relations and risk management. A store naturally seeks to improve customer relations with the great majority of customers who do not present check transaction problems by efficiently and quickly authorizing check transactions. However, the store must guard against the financial risks from customers who do write bad checks, either as part of a concerted bad check scheme or as a result of less larcenous conduct that may range from simple bookkeeping mistakes to overly aggressive check floating. In the former case, bad check risk is greatly dependent upon abnormal check transaction activity over a given interval. In the latter cases, the bad check risk is greatly dependent upon check transaction history (total check transaction frequency and dollar volume at a store).

Brief Summary Text (12):

Beyond these check and credit verification and risk management problems, grocery and other retail stores have a broader problem in accumulating customer information because of the emphasis on minimizing the amount of time required for a sales transaction, and the attendant impersonality of the customer relationship. Thus, it is extremely difficult to develop any meaningful customer profiles, or to identify customer groups such as regular customers and new customers who might become regular customers. If a store could accumulate more detailed customer information, customer profiles could be developed and used for targeted advertising, marketing and promotional programs.

Brief Summary Text (13):

Accordingly, a need exists for a transaction processing system for individual stores (in both single and multiple store environments) that facilitates transactions by improving the efficiency of the verification process, and that maintains a local customer database containing transactional information about the store's customers useful for verification risk management, and for other customer relations purposes such as identifying new customers and profiling regular customers.

Brief Summary Text (14):

Prior credit verification systems require connecting a point-of-sale terminal through telephone lines to a remote transaction processing system, thereby increasing not only the cost of operating the systems, but also increasing the time for providing check or credit verification. Also, existing systems typically do not focus on maintaining a local customer database useful not only for check or credit or debit card transaction processing, but also for identifying new customers and developing customer profiles for regular customers.

Brief Summary Text (16):

Copending patent application Serial No. 07/826,255 discloses a system and technique wherein a customer's checking account number may be used as a unique customer identification number to provide credit verification and also to perform marketing functions. In such a prior system, such customer checking account numbers have been manually entered by the retail store clerk, thus causing delay and possible inaccuracies. A need has thus arisen for an automated system for providing quick and efficient check verification and marketing follow-up. Previous automatic readers have, however, not been satisfactory for such purposes, because of their inability to uniformly detect desired account information on all checks in a consistent manner.

Brief Summary Text (20):

A need has thus arisen for a method and system utilizable by retail stores to provide targeted incentive marketing to customers by utilizing account codes on such financial instruments as a check, credit card or debit card, without the combination of a marketing card. It would be further advantageous for such a method and system to be able to utilize a multiplicity of transaction documents in order to identify individual customers to enable such targeted marketing. It would further be desirable to provide such targeted marketing in combination with credit verification.

Brief Summary Text (22):

Important aspects of the present invention are to facilitate transactions by reducing the requirements for customer identification, to enable a store to adopt a risk management approach to credit verification based on a customer's transactional history (frequency and dollar volume over specified intervals), and to improve a store's marketing and other customer relations programs by collecting transactional data for that store, both current and historical, that can be used to identify new or infrequent customers, develop customer profiles and to perform targeted marketing.

Brief Summary Text (23):

More specifically, this invention is a transaction processing system that uses a customer's financial instrument account number (check, credit card, debit card or the like) as a unique customer identification number. Thus, the system does not require time-consuming checking of additional customer identification, but only requires the speedy entry of the customer's account number by use of an improved automatic reader in accordance with the present invention. The system operates at an individual store, and maintains at that store a local customer database of customer records, each identified by the corresponding customer identification number. The customer records also include customer information, such as verification data (such as verification status) as well as other selected transactional data (such as transaction frequency and dollar volume), the verification and transaction data being regularly updated with new data (such as during transaction verification).

Brief Summary Text (24):

The system includes one or more transaction terminals, coupled to a transaction processor that stores the customer database. A transaction terminal is used to transmit a customer information request (such as for check or credit card transaction verification), which includes an automatically read customer's identification number, from the point-of-sale (POS) to the transaction processor.

Brief Summary Text (25):

The transaction processor processes the customer information request, using the identification number to search the customer database and retrieve the corresponding customer record, if any. Based on the customer information in the customer record, or the lack of a customer record, the transaction processor returns an appropriate response (such as credit verification status) and marketing response information to the transaction terminal.

Brief Summary Text (26):

Thus, the method of this invention for transaction processing involves various aspects of: (a) identifying a customer by automatically reading the customer's unique ID; (b) developing and maintaining for a store a local customer database of customer records, each identified by the corresponding customer identification number, and each including customer information (such as verification status and transactional data); (c) generating a customer information request; (d) processing the request using the customer identification number to access the corresponding customer record, if any; (e) returning an appropriate customer information response based on the customer information in the customer record; (f) updating the customer database regularly to reflect new customer information; and (g) utilizing the database to perform targeted marketing functions based upon the customer's prior shopping history.

Brief Summary Text (31):

Moreover, because the transactional data is generated and maintained locally, it provides significant information about the store's customers over and above the information necessary for verification risk management. New customers are readily identified, and prior shopping history such as frequency and dollar volume information may be used to establish customer profiles and to target advertising, marketing and promotional programs, and for other customer relations purposes.

Brief Summary Text (34):

Important features and advantages of this invention are the following. The transaction processing system uses the automatic reading of the customer's identification number, which is used as a unique customer identification number, thus avoiding the requirement for additional identification and the attendant delay in completing the transaction.

Brief Summary Text (36):

For check verification, the system uses three primary status levels--POSITIVE, NEGATIVE and CAUTION--allowing the store to identify those customers with a bad check outstanding, and to identify new customers and establish selected interim risk management procedures for granting those customers check transaction privileges. In addition to check verification status, the system collects and accumulates selected additional transactional data, including frequency and dollar amounts over specified intervals (such as Day/Week/Month/Quarter/Total) and other historical information such as departments shopped, products purchased and the like, thus allowing the store to adopt risk management approach to check verification tailored to the store's particular customer and financial situation by conditioning check authorization on meeting certain selected transactional limits regardless of customer status (the CALL MANAGER response), and allowing the store to develop customer profiles and to target advertising, marketing and promotions, and otherwise improve customer relations.

Brief Summary Text (39):

The system and method of the invention also provides automatic targeting of individual customers based upon their shopping history. Thus, at the point-of-sale, coupons or other incentives may be generated which are specifically targeted to a specific customer based upon his prior history. Alternatively, coupons may be later mailed to selected customer. For example, substantial rewards may be given to an infrequent shopper, while less substantial rewards may be given to a more frequent shopper. A marketing program may be implemented whereby a customer is sequentially induced to purchase additional volume or additional products based upon the customer's prior history. Based upon that customer's prior history, the types of incentive coupons can be varied by the system. Further, the redemption and efficiency of the coupons are subsequently monitored, and subsequent coupons are varied in dependency upon the monitoring. All of these and many other marketing techniques described herein are able to be accomplished in coordination with a check verification or credit authorization system without requiring additional customer identification codes.

Drawing Description Text (28):

FIG. 21 is a block diagram of the All Payments/Marketing ("AP/M") system of the invention, including peripheral financial instrument reading devices and a coupon printer in accordance with the invention;

Drawing Description Text (35) :

FIG. 29 is a program flow diagram illustrating a method of increasing a customer's average purchase by providing the customer with a Coupon "M";

Drawing Description Text (37) :

FIG. 32 is a program flow diagram of a subroutine for coupon disbursements, providing the perform build coupon list in the flow diagram of FIG. 30;

Detailed Description Text (4) :

A customer's bank checking account number provides a unique identification for that customer--using this check ID, a customer record is created and included in the local customer database. The customer record includes an assigned customer verification status, as well as selected transactional data. Customer status designations include POSITIVE, NEGATIVE and CAUTION, while transactional data includes transaction frequency and dollar volume over given intervals (such as Day/Week/Total or DWT). Selected transactional (CALL MANAGER) limits are assigned to both CAUTION and POSITIVE status. This customer information (customer status and transactional data) in the customer database is continuously updated (a) on a local basis through either processing check verification requests, or inputting customer status, and (b) in the case of a multiple store business, on a global basis through inter-store transfers of selected customer information (such as CAUTION and NEGATIVE status information).

Detailed Description Text (7) :

The check transaction processing system is located at a store, and maintains a local customer database for that store. For a multiple store business, a local system is located at each store and global customer information transfers are used to supplement the essentially local customer database.

Detailed Description Text (19) :

For example, to initiate a check verification request, check reader 121 automatically scans the magnetic ink character recognition (MICR) data printed along the bottom edge of the customer's check and then the store clerk operates the keypad 122 to enter the amount of the check, along with the function code designating check verification. This request is displayed on display 124, and sent, along with data from the check reader 121, to transaction processor 112. The check verification response, including the customer's verification status (such as POSITIVE, NEGATIVE or CAUTION), and marketing information (such as the type of coupon to be dispensed) returned by the transaction processor is then displayed on display 124.

Detailed Description Text (21) :

The MICR encoding of checks is known, and a detailed explanation of the MICR encoding scheme may be found in The MICR Handbook by Rylla R. Goldberg, published by Heath Printers, the subject matter which is hereby incorporated by reference. As noted in The MICR Handbook, and as will be subsequently described, the field of the MICR symbology located on the bottom of the check is broken into various data fields in which different banks can place different data at different locations. Conventional automatic check readers such as those noted in the above-noted patents often cannot detect a customer's checking account number because it is interspersed with other data such as the check sequence number.

Detailed Description Text (22) :

The present automatic check reader is provided with structure which enables the customer checking account number and the bank transit number (which identifies the bank) to be detected within the code printed on the customer's check. This process involves detecting or parsing (the examination or analysis of a string of numbers or characters which is designed to detect or identify various subgroupings or sets within the string) followed by extraction of that set or sets which have been defined as the customer checking account number. The present automatic check reader is thus provided with circuitry which enables the customer's checking account number and the bank transit number to be parsed or detected and the remainder of the data extracted or omitted, such that the customer's checking account number and the bank transit number may be used as the unique customer identification code for the present invention. The present check reader thus provides substantial advantages over prior check readers which have not been useful for check verification or marketing techniques because it was not possible for such prior check readers to consistently detect customer account

numbers on checks presented from different banks and bank branches.

Detailed Description Text (35) :

The important aspect of the invention is the ability to always recognize a customer's checking account number in a MICR line automatically, no matter which bank or which type of account is involved. With the ability to generate an extremely accurate indication of the customer's account number and the bank transit number, a unique customer identification code is provided which may be utilized to provide the many advantages of the invention to be subsequently described.

Detailed Description Text (36) :

While the preferred customer identification code comprises the checking account number and the bank transit number, it should be understood that various aspects of the invention may be practical using different customer identification codes. For example, many of the marketing and verification techniques hereinafter described can be accomplished by the store clerk manually entering the name, address and/or phone number into the system through data terminal keypad 122. This unique identifying data could then be used to identify the store customer. While such manual entry is slower and not as efficient or accurate as the automatic reading of the MICR code, the manual technique may have applications in certain circumstances.

Detailed Description Text (85) :

Customer status is assigned during customer record creation, and then updated (transactionally, locally or globally) to reflect changes in customer status, such as due to elapsed time between check transactions or bad check history.

Detailed Description Text (96) :

The specific design of the customer database, and in particular the file specifications for the customer file, negative status file, and system control file, are not critical to the invention, being a matter of design choice. Any customer database will likely comprise customer records identified by the customer check ID, and include selected transactional/customer information; such as check verification status and transactional frequency and dollar volume over specified intervals.

Detailed Description Text (102) :

It can thus been seen that the check reader 119, in combination with the MICR parsing subroutine of FIGS. 4A-1 through 4A-3 operates to detect and extract the customer's account number on all checks, regardless of where located or even if improperly identified by a space or symbol. By teaching the processor any changes in the bank transit number or any unique positioning of the account number, the system thus is always able to promptly identify and detect a customer's unique ID for further use.

Detailed Description Text (151) :

2.11. Customer Information Reporting. The check transaction processing system allows a store to build and maintain a customer database containing customer information useful for identifying new customers and developing customer profiles, in addition to its use for check verification.

Detailed Description Text (153) :

Customer information reports are recommended (a) to identify new customers, and (b) to develop customer profiles, both of which can be used in targeting marketing, advertising and promotional programs, and for other customer relations purposes. Specifically, new customers are identified by regularly reporting customer records with a CAUTION status. Regular customers are identified by reporting customer records based on DWT Frequency data, while the level of a customer's business is identified by reporting customer records based on DWT \$Amount data. Additional customer information that can be readily collected in the customer records includes zip code and marital status information useful in demographic analysis.

Detailed Description Text (323) :

After the activity for sending customer records (by selected status) has executed, the next activity specified in the Event Table is for sending negative status records (both NEGATIVE and CASH ONLY status). The corresponding routine in the event subtask for executing the send negative status record activity operates identically to the send customer record routine (850) in retrieving negative status records accessed

during the current global update event interval from the negative status file and sending those records to the host.

Detailed Description Text (352) :

The present invention provides a method which may be accomplished utilizing the automatic check reader 119 in order to automatically build a database for use in a retail store marketing program. With use with the system, a customer's check is quickly scanned by the check reader 119 of the invention at the point-of-sale, or at another suitable location within the store. Due to the unique nature of the reader 119, all checks from all banks can be read and the customer identification number can be detected in any MICR location. Moreover, changes in bank transit codes and other identification changes can be automatically detected by the system so that the customer may be tracked, as previously described. The detected unique customer identification code is then transmitted to the host computer 110 which stores a previously stored database of unique customer identification codes. The detected unique customer identification code is then compared against the stored database. The system detects the occurrence of a match between information in the stored database and the detected unique customer identification code. When a match occurs, a determination is made if all necessary predetermined identification criteria related to the detected unique customer identification is in the stored database. Specifically, a determination is made if the full address and the telephone number of the detected identification code was previously stored in the database.

Detailed Description Text (353) :

If the predetermined customer identification data is found in the stored database, a signal is transmitted from the host processor 110 to the POS terminal 120 to provide a display that the customer record is complete and that no further data is required, or in the alternative a signal may be transmitted in only those instances when additional information is required to complete the database criteria. If an indication is provided that the predetermined identification criteria is not contained in the database, such as lack of address information or the like, a signal is generated to the POS terminal 120 to indicate that insufficient identification criteria exists. The store personnel may then input the required additional identification criteria into the database. The additional identification criteria is then entered into the database of the host processor 110 for storage in conjunction with the unique customer identification code. This entering of additional identification criteria will normally be done "after hours" by setting aside the check in question and entering the data in a "back room" in the store. The system also generates information about the date and amount of the transaction, which is also stored in the database.

Detailed Description Text (357) :

FIGS. 14A and B illustrate a software program subroutine operable to be performed in the host processor 110 in order to purge existing customers from a database. In operation, the system of the present invention is utilized so such that the check reader 119 automatically scans a customer's check and inputs the customer's unique identification number based upon the customer's checking account number into the system. The specific steps of the routine of FIGS. 14A and B are described in detail as follows:

Detailed Description Text (358) :

In summary, it may be seen that the technique of FIGS. 14A and B provides a method for retail store marketing which begins with the stored database of existing customers of the retail store which has been accumulated in the manner previously described. The database includes each customer's checking account identification number for use as a unique customer identification code, along with additional customer identification data such as home address, telephone number and the like. Each time a retail customer enters the retail store and makes a purchase, the unique customer identification code of the customer is detected by the present system. Comparison is made of each entered unique customer identification code with the stored database. A list of prospective customers of the retail store in a predetermined geographical area is obtained through conventional sources and is stored in the host processor 110. Comparison is made of the stored database with the list of prospective customers. All data is eliminated from the list of prospective customers which relates to information contained in the stored database, such that a non-customer database is produced which contains data relating only to prospective customers who do not appear on the stored database.

Detailed Description Text (364) :

FIGS. 15A and B illustrate a marketing program which uses the system of the present invention to detect infrequent customers such that marketing may be directed at those infrequent customers. Specifically, the techniques shown in FIGS. 15A and B identify customers who have not shopped since a predefined target date, such as thirty days. After developing this list of infrequent shoppers, the store can then mail out direct mail enticements to the customer, such as providing them with coupons and the like if they shop at that particular store.

Detailed Description Text (366) :

It may thus be seen that the program of FIGS. 15A and B provides an efficient technique of building a customer database and mailing list using checks from a variety of different banks. In operation, a customer's checking account identification number is detected by the check reader 119 for use as a unique customer identification code. As previously disclosed, a unique aspect of this invention is that the present check reader can determine checking account identification numbers even if the proper spacing and symbology is not utilized. The system can also detect changes in bank transit numbers. The checking account identification number is entered into processor 110 which contain a database that maintains customer records including the customer's name and address, the checking account identification number, and customer shopping habits and transactional data over a preselected time interval. The checking account identification number is compared with the database. A response is generated by the processor 110 to signal the presence of the customer's checking account identification number or the failure to locate the customer's checking account identification number. A new record is then created in the database for that customer's checking account identification number in response to a processor 110 response indicating the failure to locate, so that the customer's name and address is entered into the record along with a shopping incidence and shopping data being recorded in the database concurrently. A list of customers is then generated in the database whose last transaction date is prior to a preselected interval of inactivity so that grouping or subgrouping of customers is available for marketing efforts.

Detailed Description Text (370) :

In accordance with the techniques shown in FIGS. 16A and B, a customer's checking account identification number is entered as a unique customer identification code by the check reader 119. Host processor 110 is programmed to store a database which includes a plurality of unique customer identification codes and check cashing history of prior customers of the retail establishment, including date of check transactions. The processor then compares each newly entered unique customer identification code against the stored database. A signal is generated to indicate the presence of a complete customer information record or of an incomplete customer information record as a result of the comparison. A second database is then generated which lists customers whose last unique customer identification code entry date falls within a preselected date range. A promotion may then be selectively offered by the retail establishment to customers within the second database. For example, coupons or other enticements may be mailed directly to the customers on the second database, or distributed at the POS.

Detailed Description Text (375) :

Many of the prior art marketing techniques require the mailing of coupons to customers after the targeted database has been developed. With the techniques shown in FIGS. 17A and B, coupon rewards and other incentives may be made at the time of the point-of-sale. The invention contemplates at least three different ways of accomplishing a coupon reward at the point-of-sale. One is to utilize display 124 (FIG. 2A) which displays information to the store employee to indicate what type of coupon or other incentive reward is to be dispensed, and the employee hands the coupons to the customer, or in the alternative the clerk/operator may mark or set aside the check for use as a source of a mailing list for distribution of incentives. As an example, as previously noted, let us assume that three coupon packs A, B and C have been developed, based upon the desire to provide different incentive rewards for a secondary shopper, a primary shopper and high volume shopper. Three stacks of these coupon packs are placed readily available to the store employee. When a shopper comes in and presents a check, the check is scanned through the check reader 119 and the host processor 110 utilizes the technique of FIGS. 16A and B to generate an indication

of whether or not the shopper is a secondary, primary or high volume shopper. The display 124 then generates a display that says "This shopper is a primary shopper. Please give this shopper coupon pack B." The store employee would then hand the customer a coupon pack B. As other customers come through that are different types of shoppers, different coupons are provided to them. In this way, the present invention enables the store to discriminate between various types of customers in order to induce the infrequent shopper to come back, while maintaining the goodwill of good shoppers.

Detailed Description Text (376) :

A third technique of distributing coupons utilizes a system to actually print, at the point-of-sale, coupons bearing the desired information based upon selected criteria. Commercially available printers may be used for generating coupons at a point-of-sale, such as disclosed in U.S. Pat. No. 4,723,212 issued on Feb. 2, 1988 and entitled Method and Apparatus for Dispensing Discount Coupons or as further disclosed in U.S. Pat. No. 4,910,672 issued Mar. 20, 1990 and entitled Method and Apparatus for Dispensing Discount Coupons. As disclosed in the two aforesaid patents, systems may be provided to generate coupons at the point-of-sale based upon the type of product purchase. In the disclosures of the above-captioned two patents, a coupon relating to a particular type of a product is generated based upon a bar code reader determining that a triggering or competing product has just been purchased by the consumer. The same coupon dispensing apparatus described in the two aforesaid patents may be utilized to print the coupons as described in FIGS. 16A and B, but based upon the criteria and the operation of the present invention.

Detailed Description Text (378) :

5.6. Dissemination Of Point-Of-Sale Coupons And Direct Mail Coupons Based Upon Scanned Data. FIGS. 18A, B, and C illustrate a technique for generating coupons based upon the particular transaction currently being accomplished by the customer. The technique of FIGS. 18A, B, and C detect the particular store departments in which the products being purchased are located. This system requires the use of the bar code scanner to detect which products are being purchased, and which departments are being shopped by the customer. For example, the technique shown in FIGS. 18A, B, and C detects whether or not items have been purchased from the meat department, dairy department or deli. Based upon data stored within the computer, the decision is then made as to whether to award a coupon and what type of coupon to award. For example, if the data illustrates that over a period of time a shopper shows a consistent failure to shop at the delicatessen, then when the customer's check identification is scanned into the check reader 119, the processor 110 pulls up the customer's history and generates a coupon to induce the customer to shop at the delicatessen the next time the customer shops. This inducing can be done by providing the customer with a very high value coupon used only for deli shopping.

Detailed Description Text (379) :

Similarly, the stored data in processor 110 may contain information regarding particular product groups. If it is determined that the customer is a frequent shopper but does not purchase coffee, the data may determine that a coupon providing a large discount on coffee would be suitable to give to the customer. Alternatively, the system might determine that the customer had no history of buying a specific brand of coffee, and incentive coupons can be distributed for that brand of coffee. To provide this information, information regarding the particular product and the department of the product is generated by the bar code reader 123a, or through entry through the cash register, and transmitted to the host processor 110. The host processor 110 then identifies each particular product being purchased, compares it against the stored data tables and generates an indication of the type of coupon to be given to the customer. As previously noted, this indication from the host processor 110 may comprise a signal transmitted on the display 124 or the signal may be utilized to generate the actual printing of a coupon using the system similar to that shown in U.S. Pat. Nos. 4,723,212 and 4,910,672.

Detailed Description Text (380) :

The present invention differs from the systems disclosed in the above-identified patents because, among other things, the present system generates coupons based upon the lack of purchase of a particular item by comparing against stored history for unique customer IDs, rather than because of the purchase of a particular item.

Detailed Description Text (383) :

The previously described check verification system of FIGS. 1 through 18A-C has been found useful for verifying checks and providing targeted marketing as described herein. The second alternate embodiment to be hereinafter described provides similar functions, but enables the use of account numbers from a variety of financial payment or transaction instruments such as checks, credit cards and debit cards to be utilized as a customer identification number. Smart cards and marketing cards may also be utilized for the cash customer. This substantially enhances the breadth of uses of the present system and enables the retail store to track all customers whether or not they pay by check or not. The present system may thus be usable with checks, credit cards, debit cards, electronic checks (such as paperless check ACH), electronic benefits transfer such as food stamps, cards and the like, as well as proprietary merchant issued marketing cards for charging, check cashing identification or for marketing purposes which may or may not be magnetically encoded or bar encoded, as well as a smart card containing non-volatile memory. Of course, as previously noted, such proprietary merchant issued marketing cards have not been found to work well in practice for targeted marketing, but the present system may be used to accept their customer identification codes in order to enhance the universality of the present system.

Detailed Description Text (388) :

The system can also predict a customer's next due date to purchase a type of product. If a customer begins a pattern of buying a certain type of diapers, but the customer is an infrequent shopper or sub-par spender, this system may induce that customer to shop more often or to spend more by issuing an incentive to the customer to purchase diapers at the time which the customer's history has indicated that the customer buys diapers. By tracking the purchase cycle of various products, the system can anticipate the next purchase date in order to issue incentives prior to that anticipated purchase date, or issue other incentives if the next purchase date passes and no purchase is made. The system also can provide inducement coupons that can be combined. For example, coupons may be generated for a detergent for customers who buy diapers. If a customer continuously buys coffee, a coupon can be generated by the system to provide an incentive on coffee filters. If a customer tends to buy spaghetti sauce at a particular time, the system can generate a coupon to provide a coupon on spaghetti. The system thus uses a prior shopping history of the customer in order to provide the type of coupon most likely to provide an incentive.

Detailed Description Text (389) :

The system also enables the tracking of "bargain hunter" customers. Retail stores traditionally stock depending upon the size and amount of floor space. In grocery stores, between 30,000 and 60,000 items may be stocked at any point in time. Several hundreds of these items may be involved in some type of promotion by the manufacturer or distributors of the product, or the store. The present system stores a shopping history or spending history of the customer to identify whether or not the customer is a "bargain hunter" and to what degree the customer is price sensitive.

Detailed Description Text (393) :

Another aspect of the present invention is the generation of a random or lottery coupon. The system may be programmed to reward random customers with a particular reward. For example, every repeat customer might receive a coupon for a free turkey or six-pack of drinks by the coupon printer. Alternatively, the generation of such gifts could be randomly generated in order to provide more of a lottery atmosphere to the awards. Different types of shoppers, as determined by their shopping history, might be provided with different random prizes. Alternatively, a "grab bag" coupon may be issued which covers a group of incentives, which may be accessed in a random fashion as will be subsequently described.

Detailed Description Text (398) :

FIG. 19 illustrates a block diagram of a typical embodiment of such a system in a retail store. At each POS exit from the store, there is provided a conventional Electronic Cash Register system ("ECR") 962A-E, which comprises an electronic cash register, a receipt printer and a UPC bar code scanner as will be subsequently described in greater detail in FIG. 20. In the same location at each POS exit at a retail store, there is found the AP/M and its associated peripherals which are

designated generally by the numerals 963A-E.

Detailed Description Text (404):

The advantage of using the account numbers on financial or transaction instruments is that the account numbers are preissued by companies other than the retail store, thus saving the store from the difficulty and expenses of issuing cards or identification numbers. Furthermore, all customers except those paying cash will have such preissued numbers. Further, the identification numbers can be automatically read during the payment cycle, thus saving time and facilitating targeted marketing during the sales procedure. Each of the present AP/M terminals 963A-E and their associated readers can detect the identity of the customer by means of the account or identification code associated with the customer, such as by the checking account number as previously discussed with respect to the first embodiment of this invention. Alternatively, a customer's account or identification number may comprise the credit card number associated with a credit card, a smart card number, a debit card number or the like. Alternatively, a shopping card number or the like, can be automatically read by one of the readers or can be manually input by the clerk at the AP/M keypad.

Detailed Description Text (405):

Data relating to the customer's unique identification code is applied from the individual AP/M 963A-E to the CVC controller 965, where it is associated with a database storage of the particular customer's past shopping history. The identification code is also used to provide credit verification. For checks, the verification procedure previously described in this application may be provided. In the case of credit cards, or the like, the credit card number may be checked against a periodically refreshed database in the controller 965, or the credit card number may be checked against a remote database in the known manner.

Detailed Description Text (406):

In dependence upon the credit check and the shopping history, as previously defined in this application and as will be subsequently described in greater detail with respect to this embodiment, the CVC controller 965 generates signals which are applied through the AP/M terminal to provide credit verification on the AP/M display and also to cause a high-speed printer at each point-of-sale location to print out a series of inducement coupons particularly designed to target that particular customer based upon the customer's prior shopping history. Alternatively, as will be subsequently described, electronic inducements may also be provided in lieu of the printed coupons, such as by the way of automatic discount of the customer's bill or by automatic discount of a future bill.

Detailed Description Text (408):

FIG. 20 shows in greater detail a typical ECR point-of-sale system which includes a UPC bar code scanner 966 which automatically scans the UPC affixed to each product purchased at the point-of-sale. This scanner is conventional and generates electronic signals indicative of the UPC such that the identity of the particular product, the department from which the product was sold and the price of the product can be associated therewith and stored by the ECR controller. The system further includes an electronic cash register of the type previously disclosed which includes one or more key pads 967 to enable the entry of items and other information by the clerk and to facilitate the processing of the customer's purchases. The electronic cash register also includes a display 968 which provides information regarding the price and description of the products being read by the UPC bar code scanner 966 to provide other desired information to the customer. In addition, the ECR includes a receipt printer 969 which generates a written receipt provided to the customer to indicate the amount of his purchases.

Detailed Description Text (409):

FIG. 21 illustrates in greater detail the elements of a typical AP/M terminal and its associated peripherals as shown in FIG. 19. Details of the AP/M terminal 970 will be provided in greater schematic in FIG. 39 hereinafter described. As previously indicated, a plurality of financial instrument readers are coupled to the AP/M 970, including an impact receipt printer 971, a debit card magnetic stripe reader with a PIN pad 972, a smart card reader 973, a credit card magnetic stripe 974 and a MICR code check reader 975 as previously described in FIG. 2B. It should be understood that the system shown in FIG. 21 is intended to include all possible types of automatic

reading of financial instruments, but also that it is not necessary in some embodiments to have all of the peripherals. For example, certain retail stores may find that the majority of their purchases are by cash or by check; thus, the remainder of the readers might be omitted. Alternatively, if a retail store determines that a majority of its payments are made through cash and a credit card, the check reader 975 and other readers might be omitted or added as needed.

Detailed Description Text (410):

Also coupled to the AP/M 970 is a high-speed point-of-sale coupon printer 976 which may comprise, for example, a conventional thermal coupon printer such as sold by Epson Corporation (model #T80 printer). The AP/M 970 also includes a visual display, such as a LCD display or the like. The display generates prompts to the clerk to assist in operation of the system, as well as providing credit verification and other functions. The keypad on the AP/M 970 enables the clerk to input customer identification data and the like into the system.

Detailed Description Text (411):

In operation of the system shown in FIG. 21, if the customer desires to make payment by a debit card, the debit card is swiped through the reader 972 and the magnetic stripe on the debit card is automatically read by the reader. Many debit/credit cards contain a bank ID number and a customer account number, which can be combined to form a unique customer ID number. A PIN pad 972-A is associated with reader 972 in order to enable the customer's PIN number to be entered by the customer, if necessary or desired. Although, the PIN pad 972-A is shown with its data path going through the reader 972, in many instances, the PIN pad 972-A output would go directly to the AP/M 970. When a debit card is read, information regarding the purchase is applied through the AP/M 970 and the CVC controller 965 in order to debit the necessary dollar amount from the bank account indicated on the debit card, to provide verification authorization regarding the debit card and to use the account number information on the card to identify the customer to provide the marketing techniques of the present invention.

Detailed Description Text (412):

For example, if a debit card is swiped through the debit card reader 972, the CVC controller 965 would indicate on the display of the AP/M 970 that sufficient funds are available in the account indicated on the debit card. In operation, the CVC controller 965 would operate through a conventional dial-up credit verification system to obtain the credit verification and debit card information for authorizing the debit card transaction. Information regarding the unique customer identification and the transaction would then be stored in the database of the CVC controller 965 such that the targeted marketing of the system could be accomplished by printing desired coupons at the printer 976. As will be described, different coupons are printed in response to the prior shopping history of the customer in order to induce customers using different techniques based upon their prior shopping history. At this time, the impact receipt printer 971 would then generate a receipt or other indication of the purchase. In some instances, the receipt printer 971 will not be necessary due to the presence of the printer 969 shown in FIG. 20, which can be used to print the coupons and the receipts.

Detailed Description Text (413):

If the customer provides a smart card for payment of the purchases just made, the smart card would be swiped through the smart card reader 973 and the particular account code associated with the smart card would be detected by the CVC controller 965 and compared against the database. If the system detects the account code and the customer is a recognized customer, then the purchases of the customer are stored in the CVC controller database and, in dependence upon the customer's prior shopping history, coupons are generated by the printer 976 in order to induce that customer. The customer presenting the smart card might make the payment in cash or by debit card, credit card or check and those transactions would be processed as hereafter described.

Detailed Description Text (414):

If a credit card is used for payment at the POS, the credit card is swiped through the reader 974 and the credit card number is used by the CVC controller to identify the customer for accessing the customer's database. The clerk at the point-of-sale would

then enter in the transaction volume through the keyboard of the AP/M 970. The CVC controller 965 would provide credit authorization by use of a conventional dollar verification technique and would provide an identification of the verification of the credit card via the display in the AP/M 970. The amount of purchase information and the items purchased would be received by the CVC controller 965 from the ECR system through the passive listening device 964.

Detailed Description Text (415):

As further shown in FIG. 21, if the customer desires to pay by check, the check is swiped through the MICR reader 975 and the MICR code is read and detected as previously described in prior figures and descriptions. The check can then be authorized by the display on the AP/M terminal 970 and the MICR code banking account number is used to identify the individual customer to enable the providing of unique marketing incentives by printing out unique coupons at the printer 976.

Detailed Description Text (416):

Although various types of payment instruments and identification instruments have been illustrated for use with the AP/M in FIG. 21, it will be appreciated that other types of payment instruments bearing unique identification numbers are envisioned for use with the present system, both to provide payment identification for verification but also to provide unique identification of customers for the marketing techniques of the present invention.

Detailed Description Text (420):

FIG. 24 is a flow chart of the taking of a shopping card which has been previously distributed by the retail store to the customers. Usually these types of cards are presented only after obtaining substantial financial and other history of the customer which may then input into the database of the CVR controller 965. In this system, such cards are a useful adjunct in that they may continue in use so that cash paying shoppers are not otherwise excluded from participation in marketing promotions distributed by this system. Each of the cards is provided with a unique number which is used to identify the customers in place of the customer checking account, bank account number or credit card number or the like. This flow chart illustrates the reading of the various types of shopping cards, including magnetic stripe and/or smart cards. Alternatively, the system provides for manual input of the customer identification numbers through the key pad on the AP/M and also envisions the use of a shopping card which may be scanned by the UPC code scanner.

Detailed Description Text (423):

FIG. 27 illustrates the method of tracking infrequent shoppers such that a Coupon "A" may be generated by the high-speed point-of-sale printer 976. Coupon "A", as will be subsequently described, is defined as "coupons to incent what has been determined to be an infrequent shopper, that is a shopper who fails to meet predetermined shopping criteria". For example, criteria may be set of a predetermined number of shopping visits in a predetermined time. If the customer fails to meet the required number of shopping visits, he/she is determined to be an infrequent shopper and Coupon "A" may be used to incent that shopper. As will be subsequently described, Coupon "A" provides greater coupon incentives than are provided to customers who are more frequent shoppers. Although an infrequent shopper has been herein described as a customer failing to meet previous shopping criteria, the infrequent shopper may also be defined as a customer meeting predetermined infrequent shopping criteria, that is by not having visited a store in a predetermined time in a predetermined time interval. The flow chart in FIG. 27 also illustrates the generation of Super "A" Coupons to an infrequent shopper who has been previously targeted for marketing but has failed to respond. The steps include:

Detailed Description Text (424):

FIG. 28 illustrates the detecting techniques used to identify an infrequent shopper for placing that customer on an infrequent incentive program such that Coupon "A" s are generated. The steps include:

Detailed Description Text (429):

FIG. 33 illustrates a flow chart for the redemption of coupons electronically. For example, rather than printing out coupons at the printer 976, discounts may be electronically generated and developed by the CVC controller 965. For example, credits

for prior purchases may be developed and stored by the CVC controller 965 and applied at subsequent point-of-sale transactions as exemplified by the flow chart of FIG. 33:

Detailed Description Text (436):

The terminal further includes an EPROM 979 and a RAM 980. A TTL.fwdarw.RS232 communications conversion amplifier chip 981 permits the use of either TTL or RS232 signals, to permit a wide variety of commercially available peripherals, printers, check readers and the like.

Detailed Description Text (437):

An 8-position DIP switch 982 permits each AP/M terminal in a store-wide system to be uniquely identified with an electrical address. Power jack 983 provides a connection for external DC power to operate the terminal. D-subminiature 9 contact connectors 984 and 985 provide multiple purpose input/output ports, any one of which may be connected to a high speed thermal POS printer, an impact receipt printer, a debit card magnetic stripe reader, a PIN entry keypad, a smart card read/write unit, a credit card magnetic stripe reader and a MICR reader. Display for the terminal is provided by the LCD 986. A nineteen key pad is provided to allow data to be manually input.

Detailed Description Text (453):

With respect to Coupon "M" as described herein, a criteria is set of prior purchases and an attempt is made to incent someone to increase that historical level of prior purchases. Taking that historical purchase level as a base, Coupon "M" seeks to incent above that by providing customer response monitoring to each to an incentive. An incentive is provided to increase customer purchases, the system monitors and records that incentive in the customer history file, then the system monitors and records the response. If the customer meets that response criteria, the store can either maintain that incentive over a preselected time or the store can reduce that incentive over a preselected time either immediately or subsequently. Alternatively, the store can maintain the incentive a while and then choose to increase it or the store can increase the incentive if the customer has not favorably met a response criteria. The coupon increase can be organized in successive layers. A new incentive can be issued, the response is monitored and if they meet the response, the system can choose among the alternatives of maintaining or reducing. If they do not meet the response criteria, the system can increase the coupon value, or differentiate subsequent coupons, until the desired reaction is obtained from the individual customer or household.

Detailed Description Text (454):

While the prior disclosure has described infrequent shopping history criteria in terms of store purchases, department purchases or specific product purchases, it is important also to use arbitrary groupings of products and use that as a target criteria. This grouping of products may not include just all cookies for example, but an arbitrary grouping of products might include any number of different types of snack foods. It is important to include arbitrary groupings of products, because if a single product is set up as a criteria and someone is infrequent to that criteria, a manufacturer might believe the customer is not buying chocolate chip cookies and the customer needs to be incented to buy chocolate cookies. In fact, the manufacturer may make many different varieties of cookies, and the customer may buy a different type cookie. Thus, the manufacturer may then be substituting one cookie in the product line for another and having a commensurate reduction in gross profit because they would be using an incentive to do so.

Detailed Description Text (456):

The history of products being purchased is stored and organized into arbitrary groups by manufacturer in the present database, so that a manufacturer does not take business from himself. An average buying cycle may be determined over the entire customer base. As an example, assume for this entire store or this entire region, the average consumption of a coffee product is 4 ounces per week. Although the coffee is only bought every eight weeks, the consumption rate of that coffee is 4 oz. a week. The system may store the average consumption rate for the customer base as a whole so that the store can use that as a starting point for saying that a customer is at or below this consumption rate. That says nothing about the individual household, but the average consumption rate is a starting point that says on a new customer or a new promotion for a coffee, the store has a standard to begin with. Therefore, a customer

who buys 3 oz. a week should be incted.

Detailed Description Text (469):

The identifiers listed below are available for display on any coupon printed by the system. These special macros are flagged with a preceding '@'. For example, if a beginning valid date is indicated on the coupon, a "@DB" would be placed on the line: Coupon Valid @DB.

Detailed Description Text (474):

Utilizing the coupon configuration set forth in Table 7, a Customer No. 1 profile is provided in order to indicate a customer to which would be provided a COUPON "B" by the printer. It may seen in this instance, Customer No. 1 has made a total of 223 trips to the store with an average purchase of \$22.43. The current purchase being made by the customer is \$24.98. In the last eight weeks, the customer has attended the store six times, once one week ago, once two weeks ago, once four weeks ago, once five weeks ago, once six weeks ago, and once seven weeks ago. This customer is denoted a frequent shopper and thus will not be provided a COUPON "A" which would be reserved for an infrequent shopper. Thus, Customer No. 1 would be provided with a COUPON "B".

Detailed Description Text (476):

Paragraph 3 of Table 7 illustrates the various coupons which would be generated by the system for Customer No. 1. Six standard coupons would be first spooled out by the printer of the invention, which would include informational coupons advertising the store's new delicatessen. The standard coupons would also provide installment coupons of 25 "turkey bucks". The customer could accumulate the turkey bucks until a certain number had been reached, at which time he or she could receive a turkey. Coupons also include an outside coupon providing a free drink at Rod's sandwich shop with the purchase of a sandwich. A discount coupon would also be spooled off to the customer which provides 50.cent. off canned peas, another discount coupon providing 75.cent. off chicken fryers and a sixth coupon providing a \$3.00 discount off of a new prescription. Customer No. 1, being denoted as a COUPON "B" type of customer, would be provided with two "B" COUPONS providing a discount of 50.cent. off a laundry detergent and another coupon providing 25.cent. off a cereal.

Detailed Description Text (477):

The coupons spooled off to Customer No. 1 may be compared to the coupons spooled off to Customer No. 2, which are set forth in Paragraph 4. Customer No. 2 receives essentially the same standard six coupons, with the exception that this customer obtains 48 turkey bucks due to the higher level of his purchases, the current purchase being approximately \$48. Customer No. 2 receives two "C" COUPONS, one providing a discount of \$1.00 off a bakery purchase of \$5.00 or more and a second providing a discount of 50.cent. off of 1/2 gallon ice cream.

Detailed Description Text (480):

Paragraph 7 lists the coupons provided to Customer No. 3. It may be seen that the six standard coupons are the same as previously described, except that Customer No. 3 receives 59 turkey bucks because of his higher purchase. Customer No. 3 receives two "D" COUPONS, the first providing \$2.00 off of the purchase of meat of \$10.00 or more and a \$1.00 discount off a deli pizza.

Detailed Description Text (481):

Paragraph 8 indicates the coupons to be spooled off by the printer to Customer No. 4. Again, the six standard coupons are provided, with the exception that 127 turkey bucks are provided to the customer because of the high purchases. In this instance, the customer is provided with two discount "E" COUPONS, the first providing a \$2.00 discount off a deli purchase of \$10.00 or more and a \$3.00 discount off of any five gourmet style frozen entre. In addition, a random lottery COUPON "E" is provided wherein one coupon is randomly generated out of each 100 accesses of the COUPON "E" database. If Customer No. 4 was the lucky winner of the random 1 out of 100 access, Customer No. 4 would be provided a coupon indicating that he or she is a lucky winner of a free ten pound turkey. This random lottery feature generates excitement among high volume purchasers.

Detailed Description Text (484):

Paragraph 10 illustrates the first trip back to the store by Customer No. 5 after at

least an 8 week absence. The COUPON "A" level 5 procedure is implemented such that the customer is provided with the six standard coupons previously noted. However, in this instance, the customer is also provided with COUPON "D" providing the customer with discounts off of meat and the deli pizza. In addition, this customer is provided with a substantial inducement discount of \$8.00 off the next purchase of \$40.00 or more or \$4.00 off the next purchase of \$25.00 or more. In addition, the customer is provided with three additional discount coupons for discounts off of soda, milk and eggs.

Detailed Description Text (485) :

Paragraph 11 indicates that the customer was indeed induced to return back to the store 7 days later by the high coupon values and purchased \$71.78 worth of groceries. Again, the customer was provided with the six standard coupons and was provided with two "D" COUPONS. The customer was provided four A-5 coupons providing a discount of \$4.00 off the next purchase of \$25.00 or more plus discounts off of soda, milk and eggs.

Detailed Description Text (486) :

Paragraph 12 indicates a return by the customer 5 days later and a purchase of \$54.81. Again, the six standard coupons were generated to the customer, along with two "D" COUPONS. Four A-5 coupons were provided, one providing a discount of \$4.00 off the next purchase of \$25 or more and discounts on soda, milk and eggs.

Detailed Description Text (489) :

Paragraph 2 of Table 8 indicates a profile of Customer No. 6 in order to illustrate the generation of a COUPON "M" program. Customer No. 6 is determined by the system to have made 223 total trips to the store and has an average purchase of \$22.43. The customer has attended the store six times in the last eight weeks and is therefore a frequent shopper. However, the system determines the "Maxxer base" or average purchase of the customer now to be \$22 each store visit and the program will attempt to induce the customer to increase his or her average purchases to \$25 per visit within a three visit program. Paragraph 3 of Table 8 illustrates the coupons that are generated by the COUPON "M" program. The customer is provided with the normal six standard coupons previously noted and two "B" COUPONS. However, the customer is also distributed a "M" COUPON providing a discount \$1.00 off of the next grocery purchase of \$25 or more, in order to attempt to induce the customer to increase his average purchase.

Detailed Description Text (490) :

Paragraph 4 illustrates trip number two, seven days later wherein the customer indeed does increase his purchases to \$31.68. The customer is again generated the six standard coupons and two "B" COUPONS, but is additionally generated another "M" COUPON which provides him with a \$1.00 discount off the next grocery purchase of \$25 or more. Paragraph 5 illustrates the next visit of the customer seven days later-wherein a purchase of \$36.45 is made. Again, the standard coupons and two B COUPONS are generated, along with a "M" COUPON again providing a \$1.00 discount off the next purchase of \$25 or more. Paragraph 6 illustrates trip number four wherein a \$29.67 purchase is made, providing an average purchase since the M program began of \$32.60. The program is determined to be successful and complete and the "M" COUPON program is deleted. The customer then receives the standard six coupons along with two B COUPONS but in this instance does no longer receive a "M" COUPON.

Detailed Description Text (503) :

Paragraph 5 illustrates the third trip by the customer and indicates that the customer only purchased \$16.45. The system again generates the ECHO COUPON providing \$1 discount off disposable diapers.

Detailed Description Text (509) :

The following provides additional information on how the present system enables targeted marketing to households which are infrequent shoppers of a particular product group. Assume a manufacturer of five varieties of chocolate chip cookies (BRAND A) wants to target marketing at households who historically demonstrate an infrequency to their product group. The following parameters are set in a group of grocery stores utilizing the present invention: Householding is activated linking the various accounts of various payment instruments within a single household based on the household's telephone number. Historical shopping history is transferred between stores to ensure purchases at all locations is merged. The consumption of the

following products are tracked in order to arrive at an average rate of consumption of bakery type snack products (PRODUCT TYPE): 1. Manufacturer's own product group. 2. Other manufacturer's chocolate chip cookies (BRANDS B, C, and D)

Detailed Description Text (510) :

UPC's and product sizes in ounces are stored in the Bar Code Tracking Table (BCTT). Cookies other than chocolate chip (i.e., BRAND E'S creme filled Cookies). Other bakery type snack items such as BRAND F's cupcakes and other cake type snack items. The following Levels of Coupon "A" are set with each level providing incentives for 5 trips. The "deal" represents the discount offered off of list price for each level, as shown on Table 11.

Detailed Description Text (525) :

FIGS. 44A and B illustrate a program flow chart of the present system providing a method of tracking infrequency to a product group, by generating Coupon "A". The program steps include:

Detailed Description Text (527) :

FIGS. 46A-B and 47 illustrate flow diagrams of further aspects of the operation of the system previously described in FIGS. 19 through 45A-B. The ECHO coupon has been previously described, and is issued in response to stored data of a customer's prior purchases of products. From this stored data, a subset list of products frequently previously purchased by the customer in previous visits is accumulated. Previously purchased products are then used as the incenting product for coupons to the customer. In other words, if the customer consistently purchases a type of cookies, the system issues coupons which provide discounts on those cookies for future visits to the store. This ensures that the customer receives coupons that he/she is attracted to, because of the customer's prior history of purchasing the products, so that the customer is incented to return to the store. In some instances, however, a particular customer may have previously purchased a large number of products. For example, some customers may over a period of time purchase over 100 different products. Techniques are thus provided to select a subset of products from such long lists for use with incentive coupons.

Detailed Description Text (528) :

First, the technique purges, or determines not to use, products in the stored list that have had a predetermined period of inactivity. In other words, if the customer's history indicates that the customer has not purchased a product for a certain period of time, this product is determined not to be a product which can be used to incent that customer and that product is not used on a discount coupon. Further, products are purged or ignored that have relative inactivity to other products. For example, if a customer has purchased four different kinds of cookies over a period of time, the cookie which has the greatest and most recent purchasing activity is chosen as an incentive and the remaining three are purged or ignored. The greatest purchasing activity may be measured in dollars, ounces, or the like. Thus, the present invention not only stores a list of products previously purchased by a customer, but applies predetermined formulas to pick the best products for use as an incentive.

Detailed Description Text (537) :

In further summary of this aspect of the invention, products previously purchased by a customer are stored in the database. The customer's identification code is entered at the point-of-sale by scanning the MICR code of the check or by scanning a credit card as previously described. Products are selected from the product database which meet a frequent purchasing history criteria, determined by period of purchase and or a dollar value. At this time, a consumption rate analysis may be performed on the products and if a product meets a predetermined consumption criteria, this product is designated as eligible for use as an incentive.

Detailed Description Text (538) :

The incentive value for infrequent shopping history criteria is established. An incentive value formula is applied by the controller 965 to the products which meet the frequent purchasing history criteria. The system then determines whether or not the identification entered at the point-of-sale meets an infrequent shopping history criteria. For example, a determination may be made that a particular customer is to receive a simple COUPON A or a SUPER A coupon, based upon the selected incentive

products. The system then issues first incentive coupons whose value is contingent upon a future transaction. A response criteria is then established to determine whether or not the issuing of a incentive coupon has been a success. Future transactions by the customer are monitored in order to determine the success of the first incentive coupons. If the customer fails to meet predetermined response criteria, additional incentive coupons of differentiated value are then issued by the system in order to further incent the customer as previously described.

Detailed Description Text (547):

Examples of the coupons printed at the point-of-sale printer are as follows:

Detailed Description Text (550):

Assuming that this customer responds to these coupons and continues on the COUPON A program for the following weeks, the logical incentive in two weeks will be the 1 lb. package of Brand A Decaf Coffee in the automatic drip filters, and the week after that the 1 gallon bottle of Brand B Liquid Detergent with Bleach. In other words, exact products in exact sizes tailored to the purchasing history of each discreet ID will be used in order to incent this customer to shop ABC Foods more frequently.

Detailed Description Paragraph Table (21):

Step Description 3 Beginning of process being flowed. 5 Check is taken for tendering purchase at retail store. 6 Once the bank's transit number and customer's checking account number are parsed from the MICR band, they are combined (transit number followed by account number) to form the customer's unique checking account ID. This ID is used as a primary key for a customer database on disk indexed by checking account ID. 10 If no records exists, one is created for this checking account ID and the operator is signaled the record is incomplete of predetermined identification criteria. 13 If a record exists in the database for the customer with this checking account ID, the completeness of predetermined identification criteria is checked and the result is signaled back to the operator. Shopping event and dollars spent are recorded in order to build a shopping history for each customer's record. 14-15 The store has on hand coupons to be handed out at the point-of-sale. These coupons may be arranged into varying value packages. We will assume 3 different coupon packs for point-of-sale dispersement: Coupon VALUE A: For customer who has been determined to be a SECONDARY shopper. This would be incentive to make them become a PRIMARY shopper. Coupon VALUE B: For customer who has been determined to be a PRIMARY shopper. This would be a lesser incentive package to primarily maintain a consistency whereby everyone receives a package. Coupon VALUE C: For customer who has been determined to be a HIGH VOLUME shopper. This incentive would be used as a means to hold on to especially good shoppers. 17 There are two methods for determining the coupon package to be dispersed at the point-of-sale. Steps 18-21 deal with preselected criteria analyzed OFF-LINE and downloaded to the front end computer. Steps 23-34 deal with ON-LINE determination based on prior 30 days shopping VS two preselected dollar LIMITS (LIMIT 1 and LIMIT 2). 18 OFF-LINE ANALYSIS: 19 Preselected criteria such as shopping volume, frequency, demographics, etc. along with how they relate to the Coupon offerings are set for OFF-LINE analysis. 20 Each record is analyzed against said preselected criteria and corresponding Coupon VALUES are selected and flagged. Said Coupon VALUE information is then downloaded to the ON-LINE processor. 21 On the customer's next visit, ON-LINE processor uses said downloaded Coupon VALUE information to flag to clerk which point-of-sale Coupon VALUE package to disperse to the customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 23 ON LINE 30 DAY ANALYSIS: 24 Two dollar limits are preselected, ie: LIMIT 1 = 100.00 LIMIT 2 = 350.00 25 Prior dollars spent for the previous 30 days are calculated and compared with said preselected dollar limits. 26-27 If prior dollars spent for previous 30 days is LESS THAN LIMIT 1, customer is considered a SECONDARY shopper; Coupon VALUE A is dispersed to customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 30-31 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 1, but LESS THAN LIMIT 2, customer is considered a PRIMARY shopper; Coupon VALUE B is dispersed to customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 34 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 2, customer is considered a HIGH VOLUME shopper; Coupon VALUE C is dispersed to customer. 40-46 Coupons are dispersed either with clerk manually handing indicated packet to customer or by ON-LINE processor spooling selected Coupon VALUE to a point-of-sale coupon printer, or by having the clerk mark the check with a code so that coupons may be subsequently distributed to the customer by direct mail.

Detailed Description Paragraph Table (22):

Step Description 3 Beginning of process being flowed. 5-9 Customer's purchase is transacted using bar code scanning cash register. As each item is scanned, said cash register maintains a record of preselected criteria for each item such a product, product group, department, etc. for the customer's purchase. 10 Check is taken for tendering purchase at retail store. 15-16 Once the bank's transit number and customer's checking account number are parsed from the MICR band, they are combined (transit number followed by account number) to form the customer's unique checking account ID. This ID is used as the primary key for a customer database on disk indexed by checking account ID. 19 If no record exists, one is created for this checking account ID and the operator is signaled the record is incomplete and predetermined identification criteria. 22 Send scanned data of said preselected criteria to the ON-LINE front end processor. 23 If a record exists in the database for the customer with this checking account ID, the completeness of predetermined identification criteria is checked and the result is signaled back to the operator. Shopping event and dollars spent are recorded in order to build a shopping history for each customer's record. 24 Processor updates customer's record with the said scanned information of preselected criteria. 26-27 The store has on hand coupons to be handed out at the point-of-sale. These coupons may be arranged into varying packages. We will assume 3 different coupon packs for point-of- sale dispersement: Coupon VALUE A: For customer who has been determined to be a SECONDARY shopper. This would be incentive to make them become a PRIMARY shopper. Coupon VALUE B: For customer who has been determined to be a PRIMARY shopper. This would be a lessor incentive package to primarily maintain a consistency whereby everyone receives a package. Coupon VALUE C: For customer who has been determined to be a HIGH VOLUME shopper. This incentive would be used as a means to hold on to especially good shoppers. 29 There are two methods for determining the coupon package to be dispersed at the point-of-sale. Steps 30-33 deals with preselected criteria analyzed OFF-LINE and downloaded to the font end computer. Steps 35-46 deals with ON-LINE determination based on prior 30 days shopping VS two preselected dollar LIMITS (LIMIT 1 and LIMIT 2). 30 OFF-LINE ANALYSIS: 31 Preselected criteria such as shopping volume, frequency, demographics, etc. along with how they relate to the Coupon offerings are set for OFF-LINE analysis. 32 Each record is analyzed against said preselected criteria and corresponding Coupon VALUES are selected and flagged. Said Coupon VALUE information is then downloaded to the ON-LINE processor. 33 On the customer's next visit, ON-LINE processor uses said downloaded Coupon VALUE information to flag to clerk which point-of-sale Coupon VALUE package to disperse to the customer. Proceed to step 40 for METHOD OF DISPERSEMENT. 35 ON-LINE 30 DAY ANALYSIS: 36 Two dollar limits are preselected, ie: LIMIT 1 = 100.00 LIMIT 2 = 350.00 37 Prior dollars spent for the previous 30 days are calculated and compared with said preselected dollar limits. 38-39 If prior dollars spent for previous 30 days is LESS THAN LIMIT 1, customer is considered a SECONDARY shopper; Coupon VALUE A is dispersed to customer. Proceed to step 51 to determine WHICH coupons to disperse. 42-43 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 1, but LESS THAN LIMIT 2, customer is considered a PRIMARY shopper; Coupon VALUE B is dispersed to customer. Proceed to step 51 to determine WHICH coupons to disperse. 46 If prior dollars spent for previous 30 days is GREATER THAN LIMIT 2, customer is considered a HIGH VOLUME shopper; Coupon VALUE C is dispersed to customer. 51-52 Customer's database record contains fields to monitor preselected shopping activities such as purchase of particular products, product groups, departments, etc. 54 Processor has determined what VALUE of coupons to be dispersed, now said database fields monitoring preselected shopping activities are used to determine which coupons in particular to disperse based upon exception to previous shopping activity. 55 MAX-SUB represents the number of said preselected items (products, product groups, departments, etc.) being maintained and monitored for shopping activity. 56 TABLES represent a table of coupons that represent incentives for each said preselected item (products, product groups, departments, etc.). TABLES are arranged in order of decreasing priority. 61-70 Step through each said-preselected item in decreasing priority and check for an exception in shopping activity. If the customer has not shopped this preselected item, this particular Coupon is chosen for dispersement. This process continues through said preselected items until the total value of Coupons chosen for dispersement meets or exceeds said VALUE as determined in steps 29-46. 74-78 If after stepping through said preselected items and the value of dispersement does not meet or exceed said VALUE as determined in steps 29- 46, an alternate table of general incentive coupons in order of decreasing priority is stepped through until said VALUE is met or exceeded. 83-88 Coupons are dispersed either with ON- LINE processor spooling selected Coupons to a

point-of-sale coupon printer or via Direct Mail.

Detailed Description Paragraph Table (24):

Step Description 11 ECR 962 now sends the total for this purchase to the AP/M. If the AP/M 963 and ECR are not integrated, the clerk enters the total by hand. 12 AP/M 963 sends this total to the CVC controller 965. 13 Choose a method for paying. 14 If paying with a personal check: 15 Clerk runs check through the MICR reader which sends the MICR code to the AP/M. 16 AP/M sends MICR code to the controller 965. 17 Controller parses the MICR removing the sequence number to form an account number. 18 Controller verifies the check's account number against stored positive and negative databases. 19 Controller sends verification back to the AP/M 963 for display to the clerk. 20 If paying with a credit card: 21 The credit card is swiped in the magnetic card swipe which reads the account number and sends it to the AP/M 963. 22 AP/M 963 sends the account number to the controller 965. 23 Controller 965 initiates a phone call via modem to a payments processing switch. The credit card account number and amount to tender are sent for verification. 24 Controller 965 sends result verification to the AP/M 963 for display to the clerk. 25 A receipt is printed out on the receipt printer, ECR printer, or coupon printer 976. 26 If paying with a debit card: Debit card is swiped in a magnetic card swipe which reads the account number and sends to the AP/M 963. 28 A message is sent to the PIN pad for the customer to enter their PIN number. Customer enters PIN and it is sent to AP/M 963. 29 AP/M 963 sends account number and PIN to controller. 30 Controller 965 initiates phone call via modem to a payments processing switch. The customer's debit card bank number, PIN, amount, and store's bank account number for transfer of funds are sent to the switch for processing. 31 Controller 965 sends the completion status to the AP/M for display to clerk. 32 Receipt is printed on receipt printer, ECR printer, or coupon printer 976. 33 If paying with an Automatic Clearing House (ACH or electronic check) card. 34 ACH card is swiped in a magnetic card swipe which reads the account number and sends to the AP/M 963. 35 A message is sent to the PIN pad for the customer to enter their PIN number. Customer enters PIN and it is sent to AP/M. 36 AP/M sends account number and PIN to controller. 37 Controller initiates phone call via modem to a payments processing switch. The customer's ACH card bank number, customer bank account number, PIN, amount, and store's bank account number for transfer of funds are sent to the switch for processing. 38 Controller sends the completion status to the AP/M for display to clerk. 39 Receipt is printed on receipt printer, ECR printer, or coupon printer. 40 If paying with an Electronic Benefits (EBS or electronic food stamps) Card: 41 EBS card is swiped in a magnetic swipe which reads the account number and sends to the AP/M 963. 42 A message is sent to the PIN pad for the customer to enter their PIN number. Customer enters PIN and it is sent to AP/M. 43 AP/M 963 sends account number and PIN to controller. 44 Controller initiates phone call modem to a payments processing switch. The customer's EBS card account number, PIN, and amount sent to the switch for processing 45 Controller sends the completion status to the AP/M for display to clerk. 46 Receipt is printed on receipt printer, ECR printer, or coupon printer 976.

Detailed Description Paragraph Table (28):

Step Description 82 Coupon "A" (for Absence) is used by the system to identify shoppers that are determined to be infrequent. Each store tailors and stores a definition of the infrequent shopper and a program to incent them which is stored on-line as follows: The method of determining infrequent shopper: 1. Based on dollars spent in the prior specified number of days. or, 2. An attendance record based on weekly attendance in the prior specified number of weeks. The level of incentive for infrequent shopper: 1. Multiple levels based on average amount of purchases. For example, an infrequent shopper with an average purchase of \$137 would be incented more than an infrequent shopper with an average purchase of \$23. or, 2. Multiple levels based on the number of weeks attended in the prior specified number of weeks. For example, an infrequent shopper that recorded an attendance in 0 of the prior 8 weeks could be incented more than an infrequent shopper that recorded an attendance in 3 of the prior 8 weeks. Coupons to be used for incenting the infrequent shopper. Once a customer is identified as an infrequent shopper, the customer record is updated with a Coupon "A" status and level. For example, the customer above attending 0 weeks in the last 8 weeks may be identified as an "A1" while the customer attending 3 weeks in the last 8 weeks may be identified as an "A4". Logically, the "A1" series of coupons stored would be of higher incenting value than "A4" series. Each Coupon "A" level of coupons is stored in a series based on 1 to 32 shopping trips. For example, the first

trip that the "A1" level of infrequent shopper is identified may produce 8 coupons at a value of \$35.00. Subsequent trips #2, #3, and #4 may produce 6 coupons valued at \$25.00. Subsequent trips #5 thru #10 may produce 4 coupons valued at \$20.00, etc. Criteria for Super "A" for customers not responding to the Coupon "A" program. This criteria is based on a number of days since the last incentives were given to the customer. For example, the level "A1" infrequent shopper above is given the 8 coupons valued at \$35.00 and does not come back until 8 weeks later. If the criteria for Super "A" is 30 days, this infrequent shopper is now branded Super "A" level 1 ("SA1") and will receive heavier incentives. Super "A" coupons are stored in the same level and series method as described for Coupon "A". Upon completion of a Super "A" program, the infrequent shopper falls back into the Coupon "A" program where they became a Super "A". 83 Each account record holds fields for tracking coupon programs. These fields include: Coupon type ("A1", "A2" etc.) Number of trips for this customer while in the coupon program. Super type ("SA1", "SA2, blank if none) Number of trips for this customer while in the "super" program. 84 If customer is currently in a Super "A" program: 85 Increment the field for number of trips in Super "A". 86 If Super "A" program is complete, customer falls back into Coupon "A" program where they left off. GOTO 92. If Super "A" program is NOT complete, GOTO 89. 87 If customer is NOT currently in a Coupon "A" program, GOTO 93. 88 If number of days since last visit exceeds preset criteria for determining Super "A" GOTO 89. Otherwise, GOTO 90. 89 Mark account to receive Super "A" coupons. This information will be used later when building a list of coupons to be spooled to the customer. GOTO 106. 90 Increment the field for number of trips as Coupon "A". 91 If Coupon "A" program is complete, GOTO 106. 92 Mark account to receive Coupon "A" coupons. This information will be used later when building a list of coupons to be spooled to the customer. GOTO 106.

Detailed Description Paragraph Table (31):

Step Description 122 Build a list of Coupons to be spooled to the customer. Coupons are stored and accessed based on type: Standard - these are coupons that everyone gets regardless of shopping history, special coupon programs, dollar range, etc. These are usually the weekly specials found in the store's other advertisement, coupons from other merchants, and "billboard" coupons that simply inform. This standard series ensures that EVERYONE receives something. Coupon "A" and Super "A" - these are coupons for infrequent shoppers as previously discussed. Coupon "B" thru Coupon "E" - these are coupon classes based on preset spending ranges. Coupon "M" and Super "M" - these are coupons designed to increase average purchase amounts. First in the customer's coupon list will be the standard series run. Set COUPON-TYPE to STANDARD. 123 PERFORM BUILD-COUPON-LIST (148-163B) and RETURN AT 124. 124 Now a more targeted set of coupons will be added to the list based on spending levels. These levels are determined from purchase history vs preset dollar ranges. These coupon types are Coupon "B" thru Coupon "E". For example, ranges could be set up as follows: First Range \$25-\$50 Coupon "B" Second Range \$51-\$75 Coupon "C" Third Range \$76-\$100 Coupon "D" Fourth Range \$101+ Coupon "E" 125 If spending level falls below all preset dollar ranges, GOTO 135. 126 If spending level falls within the first range: 127 Set COUPON-TYPE to COUPON-B. GOTO 134. 128 If spending level falls within the second range: 129 Set COUPON-TYPE to COUPON-C. GOTO 134. 130 If spending level falls within the third range: 131 Set COUPON-TYPE to COUPON-D. GOTO 134. 132 If spending level falls with the fourth range: 133 Set COUPON-TYPE to COUPON-E. GOTO 134. 134 PERFORM BUILD-COUPON-LIST (148-163B) and RETURN at 135.

Detailed Description Paragraph Table (35):

Step Description 180 A coupon list was built as described in steps 122-163B and will now be spooled. Access first coupon from the coupon list. 181 If end of coupon list, GOTO 193. 182 Choose medium for dispensing coupons. 183 If spooling medium is POS printer: 184 CVC Controller sends coupon to AP/M 185 AP/M sends coupon to printer. GOTO 192. 186 If spooling medium is electronic coupon on a "SMART" card: 187 Controller encrypts the coupon identification data. Encryption will prevent fraudulent coupons from being written to the card. This method optionally allows customer with "SMART" card to redeem coupons at any store from within a network. 188 Controller sends encrypted data to AP/M. 189 AP/M writes coupon to "SMART" card with read/write device. Coupon description is sent to ECR for display on purchase receipt tape. GOTO 192. 190 If spooling medium is electronic coupon on CVC controller's mass storage device: 191 CVC Controller writes coupon to an electronic coupon file with a primary key based on account number. Coupon description is sent to ECR for display on purchase receipt tape. 192 Access next coupon from the coupon list. GOTO 181. 193 END

• Detailed Description Paragraph Table (41):

Step Description 275 The CVC AP/M terminal is powered up and boots into the AP/M program. 276 Initialize AP/M terminal. The AP/M address dip switches are read to determine this AP/M's unique address. Through-out the initialization process the network is monitored to ensure that no other AP/M is using this AP/M's address. If another AP/M is using the address, control will jump to an infinite loop displaying that this AP/M's address is already being used. The CVC Marketing Systems title is displayed on the AP/M and the printer if attached. Then a message concerning issued patent protection and patents pending is displayed and printed as well. 277 Enter ID is prompted on the terminal screen to let the clerk know it is ready to accept input. The following steps are repeated as an infinite loop. The AP/M terminal resides on a network in a STAR topology using a single twisted pair balanced RS485 communications standard. The hub of the star is the CVC Controller which acts as the master. Communications is executed in a broadcast form with a token passing protocol to determine which AP/M is being addressed. In other words, if there are 3 AP/M's on the network, the Controller "polls" each AP/M one at a time in order to coordinate their activities. When an AP/M receives a poll token with its address, it responds with either an `*` which means "I'm here, but I don't need anything", or an `&` followed by data for the Controller. The AP/M may also receive a data token followed by data for display on its screen or for sending to the printer. First the AP/M checks for data from the RS485 network line. 278 If data is detected on the network: 279 PERFORM the Polling Process (steps 288-307) and RETURN at step 280. 280 Peripherals such as a check reader, coupon printer, card swipe, etc. are cabled to the AP/M terminal. These peripherals use an RS232 communications standard. The AP/M checks for data coming in from the RS232 port. 281 If data is detected, then GOTO 284. 282 Data is entered from the clerk into the AP/M via a 19-key keypad on the AP/M. The AP/M checks for data coming from its keypad. 283 If NO key has been pressed, then GOTO 277. 284 Data from the AP/M's keypad is terminated with a Carriage Return (CR). Data from peripherals may be terminated with a Carriage Return (CR) or a Line Feed (LF). Check now for an end of data character. 285 If character is NOT a LF or CR, then GOTO 287. 286 End of data has been detected. Set a SEND DATA FLAG indicating that data is to be sent to the CVC Controller the next time the AP/M is polled. GOTO 277. 287 This character will be added to the KEYPAD ENTRY PACKET which is a holding buffer to hold data awaiting a termination character. The AP/M maintains separate holding buffers for its keypad's entry and for data coming in from the RS232 port. GOTO 277.

Detailed Description Paragraph Table (42):

Step Description 288 POLLING PROCESS SUBROUTINE. When a character is read off of the RS485 network, it is analyzed to determine if it is intended for this AP/M. The following summarizes the polling characters and their functions. Assume this is an AP/M at address = 1. Polling Character (Binary) Polling character's function 100aaaaa (0x80 .vertline. pad # (bit wise boolean)) This is a poll character from the host requesting data from a specific AP/M addressed by the binary address `aaaaaa`. If the addressed AP/M has no data, it will reply with a `*`. Data sent from the AP/M will be preceded with an `&`. In the case of an error in the previous command from the host, the poll is answered with an `*`. This AP/M's poll token is 10000001 (binary). 101aaaaa (0xA0 .vertline. pad # (bit wise boolean)) This character precedes a string of data to be displayed on the addressed AP/M's display. This AP/M's display data token is 10100001 (binary). 110aaaaa (0xC0 .vertline. pad # (bit wise boolean); followed by 0x55 (01010101 binary)) These two characters precede a string of data to be sent out of the addressed AP/M's printer port. The second character (0x55) is used to ensure that the preceding token was not arbitrary garbage. The character string may contain the following special function characters: NULL (0): Indicates that the following character should have the MSB set. SOH (1): Indicates that the following character is to be passed to the printer if it is a NULL or SOH. If the following character is 2 thru 15, then the contents of special buffer addressed logical 1 thru 14 respectively will be printed. If for some reason the AP/M has no data in the specified buffer, the next poll request will be answered with an `*`. If the following character is 16 thru 29, then the following data stream is to be stored in the appropriate special buffer addressed 1 thru 14 respectively. This data stream will then be terminated with a combination SOH (1) followed by either 16 thru 29 to jump to another special buffer address for loading a data stream, a 2 thru 15 to jump to a special buffer for spooling to the printer, or any character greater than 29 to simply terminate the load process. This AP/M's print data tokens are 11000001 (binary)

followed by 01010101 (binary). 11100000 (0xE0; followed by 0x55 (01010101 binary)) These two characters precede a string of data to be sent out to all AP/M's in broadcast fashion for display on the terminal screen. 11100001 (0xE1; followed by 0x55 (01010101 binary)) These two characters precede a string of data to be sent out to all AP/M's in broadcast fashion for spooling to the printer. 289 As can be seen from studying the binary forms of the various tokens, the first three bits from the left indicate the function of the token and the remaining five bits from the AP/M address for which the token is intended. Check the poll character's first three bits. 290 Case ON OFF OFF (or 100). This is a poll for service token. 291 The lower five bits of this character can make up to 32 ON/OFF combinations. These combinations are used to determine the AP/M address for which polling is directed. In the case of this AP/M address = 1, the bit pattern would be OFF OFF OFF OFF ON (00001). If the lower five bits DO NOT EQUAL 00001, then this token is for a different AP/M. GOTO 307. 292 Token character is equal to 10000001 which is intended for this AP/M. Check the SEND DATA FLAG to see if data resides in a buffer for sending to the Controller. 293 IF "SEND DATA FLAG" is NOT SET, then GOTO 295. 294 OUTPUT a `&` character on the RS485 network. This tells their controller that data is to follow. Following the `&` character the AP/M sends the data stored in the appropriate KEYPAD ENTRY PACKET out on the RS485 network to the Controller. GOTO 33. 295 OUTPUT a `%` character on the RS485 network. This tells the Controller "I'm Here, and I have nothing to send". GOTO 307. 296 Case ON OFF ON (or 101). This is a send to display token. 297 The lower five bits of this character can make up to 32 ON/OFF combinations. These combinations are used to determine the AP/M address for which polling is directed. In the case of this AP/M address = 1, the bit pattern would be OFF OFF OFF OFF ON (00001). If the lower five bits DO NOT EQUAL 00001, then this token is for a different AP/M. GOTO 307. 298 Token character is equal; to 10100001 which is intended for this AP/M. Continue reading the rest of the display data packet. 299 Send data from the display data packet to the AP/M'S LCD display. GOTO 307. 300 Case ON ON OFF (or 110). This is a send to printer token. 301 The lower five bits of this character can make up to 32 ON/OFF combinations. These combinations are used to determine the AP/M address for which polling is directed. In the case of this AP/M address = 1, the bit pattern would be OFF OFF OFF OFF ON (00001). If the lower five bits DO NOT EQUAL 00001, then this token is for a different AP/M. GOTO 307. 302 Token character is equal to 11000001 which is intended for this AP/M. Continue reading the rest of the print data packet. 303 Send data from the print data packet to the AP/M'S RS232 port for the printer. GOTO 307. 304 Case ON ON ON (or 111). This is a BROADCAST token which is intended for every AP/M on the network. 305 The lowest bit of this character determines whether the data following is to be directed to the printer (bit is ON) or to the display (bit is OFF). 306 If the low order bit is ON (11100001) then GOTO 302. Otherwise, (bit is OFF (11100000)), then GOTO 298. 307 RETURN to calling program and resume at Step 280.

Detailed Description Paragraph Table (48):

Step Description 1 Store and maintain a history of previously purchased products for each ID. This is accomplished by capturing UPC data as it is scanned by the UPC reader, matching the UPC with products contained; in the Bar Code Tracking Table (BCTT), and, if a match exists in the BCTT, recording the purchase in a database that links product purchase history with individual ID's. 2 The list of products stored and maintained in Step #1 may potentially be used as incentives for a customer. An analysis is made to determine which products would be best suited for incenting the customer each time that customer's ID is received. If sufficient data has been recorded in the short term, a consumption rate analysis (2a-2e) is performed to further identify which products would be best suited as incentives. These products make up an "Incentive List" and are prioritized by incentive value in the following manner: 2a A consumption rate analysis is performed based on historical product purchases. Non- perishable products: that may typically be consumed over a period of more than one week are analyzed to determine the rate in which they are consumed for each ID. 2b If there is not enough recent shopping data for this ID, then GOTO 2e. 2c This consumption rate is compared with the date of last purchase so that a prediction of next purchase may be made. A priority value is assigned for each product based on the product's anticipated next purchase date (i.e., if a next purchase is past due, the priority is increased, and if the product was just purchased and the estimated next purchase date is a month off, the priority is decreased). For example, assume ID #12345 buys a 16 ounce package of: Brand A decaf coffee in automatic drip filters an average of every four weeks, and the last purchase date shown was 20 days ago. If the system should need to incent this customer for any reason, a discount on a 16 ounce

package of Brand A coffee in automatic drip filters (since historically the system has predicted that this customer will buy the product in approximately 8 days) would most likely be used. 2d Finally, an "incentive rating" is stored for each product in the BCTT that represents the store's perception of the product as an incentive. The priority value is adjusted based on this "incentive rating". For example, milk, bread, and soda may be high consumption products for many people, but since these items are commonly loss leaders available at a steep discount at most grocery stores, they may not be best suited as incentives. Therefore, these items would carry a lower "incentive rating" that would decrease the priority value. Conversely, items with very high profit margins such as bakery and deli items may be very attractive to grocers as incentives. These items would carry a higher "incentive rating" and therefore increase the priority value. 2e End of Incentive List process 3 Tables containing the "value of incentives" for varying levels of infrequency to a store, department, product group, and/or product are stored and maintained on line. Logically, the value of incentives is directly related to the level of infrequency, i.e., a higher incentive going to a frequency of one activity in eight weeks versus four activities in eight weeks. Increasing values are also available in varying levels in the event that the customer does not respond. 4 An ID entered at the point-of-sale is determined to fall short of a preset level of infrequency. An incentive program utilizing the methods discussed in #1 through #3 begins. 5 Fields in the ID's record used for incentive program tracking are initialized and the beginning of the incentive program is recorded. 6 The table discussed in #3 is accessed and the value of incentives to dispense is determined. 7 A value formula designed by the store is used to arrive at a combination of product, brand, unit size and number of units necessary to satisfy a preselected total value of incentive. The incentive will utilize those products that meet a frequent purchasing history criteria as a basis for promotion. 8 The incentive list for this ID is accessed in order of decreasing priority values. Using unit costs stored in the BCTT, coupons are created and dispensed until the "value of incentives" is met in accordance with the parameters of the value formula for the particular store. Should the number of incentives fall short of this "value of incentives", default items or "dollars off next purchase" are substituted. All of these incentives are contingent on a future transaction. 9 Monitor the transactions for this subsequent to the issuance of the incentives. 10 Establish a response criteria to determine if further incentive is necessary. 11 If the customer falls short of this response criteria, GOTO 11; otherwise, GOTO 12. 12 It is evident that the prior incentives were insufficient for motivating the customer to respond. The "value of incentive" will now be increased as determined by the tables discussed in #3. GOTO 7. 13 The customer demonstrated that the prior incentives were sufficient for achieving a desired response. If the program is complete, GOTO 13; otherwise, GOTO 7. 14 END OF PROCESS

Detailed Description Paragraph Table (55):

Step Description 1 Each time a customer shops, the products scanned are captured at the controller and a history of products purchased are stored and maintained with that customer's unique ID. Assume an ID has been entered and an ECHO coupon is to be spooled. Proceed to Step 2 to access the first item for this ID. 2 Access the next item from the list of previously purchased products that have been stored and maintained for this particular ID. 3 Check to see if this product meets a "current purchase history criteria" (i.e., products purchased, within a current time period and/or within a preset recent number of shopping transactions). For example, assume Customer A has 16 shopping transactions within the last four months. Also assume that Brand A cookies have been purchased 50 times over the life of this ID, but have not been purchased in the last four months. Although Brand A cookies show an overall frequent purchase history, the fact that they have not been purchased in the last four months indicates that they are no longer favored by this customer and therefore will not be selected for use as an ECHO coupon incentive. Assume Customer B has no shopping transactions within the last four months. Also assume that Brand A cookies have been purchased 50 times over the life of this ID and that Brand A cookies were purchased in some of the most recent transactions when Customer B was shopping four months ago. Although the stored data does not show a purchase of Brand A cookies in the last four months, there are not enough transactions since the last purchase of Brand A cookies to warrant the assumption that Brand A has fallen out of Customer B's favor. Therefore, Brand A cookies will be considered as a candidate for ECHO coupon incentive. If this product meets the "current purchase history criteria", then GOTO 4; otherwise, GOTO 6. 4 Check to see if this product meets a "relative most favored status criteria" within the product category (i.e., products purchased with relative

greater frequency of dollars, or relative greatest volume per unit of time). For example, assume that only one item from a particular product group is to be used as an ECHO COUPON incentive. Assume also that Customer A has frequently purchased Brand A cookies, but also has frequently purchased Brand B, Brand C and Brand D cookies. Assuming that Brand C cookies purchased more frequently than the other three brands in this product group, then Brand C cookies would be considered as a candidate for an ECHO COUPON incentive. Brand A, Brand B and Brand D, though frequently purchased, would not be selected as candidates since one item has already been chosen from the cookie product group. If this product meets the "relative most favored status criteria" within its product category, then GOTO 5; otherwise, GOTO 6. 5 Add product to the list of products qualified for consideration for use as an ECHO COUPON incentive. 6 If there are more products for analysis, then GOTO 2; otherwise, GOTO 7. 7 END OF PROCESS.

CLAIMS:

1. A system for targeted customer promotion at a retail store comprising: a terminal for entering a plurality of customer's identification codes, along with customer transaction data, at the point-of-sale; a bar code reader for detecting the universal product code on products purchased by said customers; a memory for storing a plurality of previously entered customer identification codes and customer transaction data; said memory further storing data relating to universal product codes of products purchased in prior shopping visits by an individual customer, such that data regarding said individual customer's product purchases and shopping histories are stored in association with said customer identification codes; a processor operable to determine from said memory a set of previously purchased products purchased by a specific customer in prior visits to the store; said set of products comprising a plurality of product brands from a plurality of product categories of products previously purchased by said individual customer; said processor determining from said set a subset of products which may be used as incentives, said subset based upon customer preference for said products in said set, wherein said preference is determined by a preference criteria based on the frequency of separate shopping visits in which said products in said set are purchased; circuitry for generating a signal upon detection of a specific customer's identification code; and apparatus responsive to said signal for issuing an incentive involving at least one product from said subset of products such that said specific customer is issued an incentive for a product preferred by said specific customer from among those previously purchased by said specific customer.
5. A method for targeted customer promotion at a retail store comprising: entering a customer's identification code, along with customer transaction data, at the point-of-sale; detecting the universal product code on products purchased by said customers; storing a plurality of previously entered customer identification codes and customer transaction data; storing data relating to universal product codes of products purchased in prior shopping visits by said customer, such that data regarding individual customer's product purchasing histories are stored in association with said customer identification codes; determining from said stored data a set of previously purchased products purchased by a specific customer in prior visits to the store; said set of products comprising a plurality of product brands from a plurality of product categories of previously purchased products; determining from said set a subset of products based upon customer preference for said products in said set, wherein said preference is determined by a preference criteria based on the purchase of said products in said set on a plurality of separate shopping visits; generating a signal upon detection of a specific customer's identification code; and in response to said signal, issuing an incentive involving at least one product from said subset of products to said specific customer for a preferred product relative to said plurality of product brands previously purchased by said specific customer.
13. The method of claim 5 wherein said step of issuing an incentive comprises printing coupons from a printer at the point-of-sale.